

# SeniorLearning – Adapting e-learning techniques for integrating senior citizens in the new digital World

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## ABSTRACT

The overall goal of the SeniorLearning project, which is being funded by the European Commission, under the GRUNDTVIG programme, is to train senior citizens on the practical use of internet, bringing them into the Information Society, by using an internet-based teaching and learning environment (e-learning). The project will eventually deliver an online e-learning environment adapted to target users in terms of usability and functionality, and a set of multi-lingual courses to train senior citizens on useful internet tools and services.

In this paper we present the first year's results of the SeniorLearning project: study and applications of pedagogical, technical and usability methodologies and approaches tailored to the needs of senior citizens in e-learning; study, application and adaptation of an e-learning environment and courses to the particularities of the target group; presentation of first draft versions of the SeniorLearning portal, courses and the learning environment; conclusion of good practices and recommendations based on the collaborative work carried out.

## INTRODUCTION

The structure of societies is changing due to unprecedented demographic changes. One of the challenges to be faced in line with this is the changing habits of older persons towards learning. Still older persons (in most studies referred to as "50 years and older") show less participation in training and learning activities compared with younger persons (for Germany cf. BMBF 2005, 25). However, authors such as Iller refer to upcoming new generations of older persons that have grown up in an environment characterized by continuous learning. She prognoses a change in the proportion of older persons participating in learning activities in the near future, making it necessary for training providers to adapt to the changing groups of customers and their needs and habits (Iller 2005, 312)<sup>1</sup>

In parallel these groups are acquainted to information and communication technologies (ICT)-based learning (in formal and informal learning settings) and increasingly articulate their interests using technologies for learning purposes. Taking into account these positive developments, existing

learning resources do not satisfy the needs of older adults. So, our objective will be to give away an e-learning environment to teach seniors the use of internet tools, which might satisfy the needs of this new market.

## OBJECTIVES AND METHODOLOGY

The SeniorLearning project objective is the design, development, testing, deployment and dissemination of a web based learning environment for senior citizens with of four e-learning courses as a starting point. Senior learners shall approach the use of computers, especially Information and Communication Technologies (ICTs), training them to readily use computers.

The final purpose is to train senior citizens on the practical use of Internet to help bring them into the information society.

To really know the real necessities of senior citizens in this field we followed next four steps:

- 1.- Questionnaire for senior citizens about their current use of the computer and the Internet as well as their wishes for the future referring to these media.
- 2.- Questionnaire for seniors organisations about their experiences and wishes referring to computer and ICT courses, especially for senior citizens.
- 3.- Identification of relevant resources (like national reports, studies, websites, ...)and analysis of senior citizens' e-learning needs and needs referring using the Internet in the countries of the project partners.
- 4.- Additionally: case studies which create a functional environment for future evaluation of the efficiency of the final system by end users.

Following the four steps described before, it helped to decide how we are going to make the design of our platform. The design of a virtual learning environment demands for specific considerations in relation to usability. The broad range of materials and tools used for teaching and learning includes paper, audio and videotape, CD-ROM, television, and the Internet. Furthermore, online content, for instance presented in a learning management systems (LMS), is varied and can include: text on a website, digital audio, digital video, animated images, and virtual reality environments. This content can be created in a variety of ways, utilizing a variety of authoring tools.

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<sup>1</sup> Iller, C.: Altern gestalten – berufliche Entwicklungsprozesse und Weiterbildung im Lebenslauf. Bonn, 2005. URL: [http://www.die-bonn.de/esprid/dokumente/doc-2005/iller05\\_01.pdf](http://www.die-bonn.de/esprid/dokumente/doc-2005/iller05_01.pdf) Download 10.8.2006

So, the next step was to define the requirements of the final users and the platform administrators. Once we did it, we have to analyse possible choices among existing Learning Management Systems (LMS). The LMS will be the backbone of the SeniorLearning system. A good LMS would have to provide for flexibility, portability, affordability and robustness, just to name some of the most important properties. Furthermore, the system should be able to deliver content in a comfortable fashion, tailored to the needs of the user, without exposing the user to unnecessary effort and / or stress. Also it was desirable to have a customizable system which can be modified to deliver other content, too, possibly put together by third parties.

Obviously, taking into account the needs of older adults, not all of these tools and approaches were equally suitable for the target group. The learning environment was at the centre of the reflections on usability. Tools and the instructional design may demand for different usability considerations in the further development process. Following the suggested iterative design process these changes and adaptations will be tested and evaluated throughout the development process, taking into account the target of our project, so in each iteration we are going to make some usability tests to know if we really satisfy the necessities of senior citizens.

With the results obtained we summarise the needs and proposed aspects for the platform development.

## **SENIOR CITIZENS E-LEARNING NEEDS.**

The recommendations that we took into account for the kind of e-learning courses within the SeniorLearning project were:

Most of the interviewees used e-communication services on the Internet. E-commerce, e-banking and e-information/e-entertainment is used often. The courses should be oriented to learn how to use applications the target groups want to use. The courses should not be too abstract due to the statement that they like to learn together with other people in formal “real world” situations. Learners prefer to get know-how which means useful skills and not a collection of know-what. Content is important, as results said that training topics could be interests and hobbies, email, online booking, etc. Didactics should be adapted to seniors’ needs and interests (referring to trainers, who should be trained as well, age-based materials, methods, training and practice time and the speed of learning). Technology should be barrier free and adapted to their needs (taking into account the usability recommendations, that we are going to explain later).

With the results obtained we proposed for the development the next aspects:

### **Methods**

Possible methods within the SeniorLearning project are:

- Learning management system with basic and advanced parts.
- Moderated courses.

- Self-learning courses (leading seniors to “auto didactical experiments”, with support of friends, peers or a senior network).
- Blended learning courses/groups.
- Additional printed or at least printable materials.
- Access to the contents also with quizzes, little games, etc.
- Links to other sources (e.g. Skype introduction) as a second resource.

### **General conditions / framework**

The SeniorLearning partners should decide about general conditions and framework:

- Barrier free and easy to use software.
- Age-based terms.
- Tutorial support
- The duration of the single course, e.g. four to six weeks
- The age-based qualification of the moderator

### **Conductorship**

- The partners also have to decide who will be the courses conductor, so it could be interesting that they decide if the courses are conducted by institutions, networks, peers. If they have to be moderated or are self-learning courses only.

### **Institutions**

The institutions which will be involved as partners in the SeniorLearning system are:

- Senior groups, networks
- Universities of third age (U3A)
- Educational institutions with offers for seniors

## **E-LEARNING COURSES**

One of the objectives of SeniorLearning platform is give to senior citizens the necessary tools to improve their skills in the www environment.

The final decision was to design four different courses, which are content-oriented and shall tie up to seniors’ learning interests. Every course should include instructions to the SeniorLearning management system.

### **1. Course for beginners**

It should include the first access to the Internet and the explanation of the use of the browser (e.g. favourites list). Usual terms should be explained with practical examples (e.g. “links”). As seniors want to use the Internet meaningfully the sensible use of basic functions of search engines should be shown. Seniors are aware of security matters, so this should be content as well. Standard websites should be shown like news, practical advice sites (e.g. health, events, further SeniorLearning courses), etc..

### **2. Course “Communication Through Internet”**

Emails, email attachments (like pictures), mailing list, chat, discussion forum, Skype, Flash meeting and their purposeful use (e.g. in senior networks and projects) should be picked out as central themes in this course.

### 3. Course “Books – example for online shopping and paying”

Books seem to be very important for seniors. They could occupy a central position in this course which explains different possibilities of using the web, including technical and cooperative aspects. At first the use of search engines and online book shops for interesting literature could be shown. Then buying books in an online store could be explained. Aspects of paying (directly at the shop, online banking, and security) could be demonstrated. At last the download of eBooks and online discussions about the books' contents with other seniors could be explained.

### 4. Course “Useful information”

The contents of this course is planning a journey with the help of the Internet and accompanying aspects, finding useful websites (e.g. about travel destinations, about booking tickets, for events, but as well for close-by hobbies like digital photography to process holiday pictures), virtual exchange with other seniors about interesting subjects for example “research by travelling” or by web 2.0 tools. The advanced use of search engines or web catalogues can be shown.

## DEMANDS ON USABILITY

Usability as defined in ISO 9241-11:1998 is understood as the *“extend to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”*. The term “Ergonomics” has a wider meaning and has been introduced in the ISO 6385 in the year 2004: *“Scientific discipline concerned with the understanding of interactions among human and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance”*.

The intention is to enable older adults to use online resources: **effectively**, **efficient**, and with a **positive attitude** towards the medium.

To design SeniorLearning platform we made some testing process, these tests consisted of:

1)- The initial testing was be done on a standard Moodle environment including selected learning materials. Tests applied included a thinking aloud test with 2 people out of the target group and a heuristic evaluation using the AARP heuristics. These tests gave basic hints about:

- very essential adaptations to be made on the platform
- getting information on advantages and disadvantages of certain types of learning materials.

2)- More Thinking aloud tests will be carried out with three persons out of the target group on a prototype of the learning

environment. Results of these tests will be fed into the final version of the learning environment.

With the results obtained with these two test that we made at the initial state of the project, we designed the actual version of SeniorLearning platform, following the usability recommendations obtained, among others:

- **Visual Design field** : Avoid the use of serif, novelty, and display typefaces. Use 12 point or 14 point type size for body text. Use medium or bold face type. Present body text in upper and lowercase letters. Use all capital letters and italics in headlines only. Reserve underlining for links.
- **Scrolling** : Avoid automatically scrolling text.
- **Colour**: Avoid yellow and blue and green in close proximity as these colours and juxtapositions are difficult for some older adults to discriminate. Use dark type or graphics against a light background, or white lettering on a black or dark-coloured background. Avoid patterned backgrounds. Warm colours and harmonic colour schemes are more suitable than cold colours and strange colour combinations...etc.
- **Buttons and Styles**: Buttons should be logically arranged. They should be large enough (the same applies to symbols and text used for them). An easy to read font...etc.
- **Language and Terminology**: Present information in a clear and familiar way. Use the active voice. Write short, straightforward sentences, etc.

3)- An adaptation of the AARP heuristics was applied to the draft versions of the four courses that were developed.

Some of the questions of this heuristic test are related to the visibility of system status, match between system and the real world, navigation support, help and documentation, message design, etc.

The results of these tests will be fed into the final version of the courses.

## SENIORLEARNING PLATFORM

To decide with LMS we were going to use to implement SeniorLearning platform we had to analyse the possible choices among existing LMSs. A good LMS will have to provide for flexibility, portability, affordability and robustness, just to name some of the most important properties. Furthermore, the system must be able to deliver content in a comfortable fashion, be customizable, tailored to the needs of the user, etc. After analysing several LMSs finally we decided to use a modified version of Moodle to implement SeniorLearning. The modular construction allows us for customizing the functionality of the system. Certain modules may be left out altogether, if necessary, and other functions can be added, as plug-ins.

Moodle is a free software e-learning platform designed to help educators to create online courses with opportunities for rich interaction. Its open source license and modular design,

means that people can develop additional functionality, and development is undertaken by a globally diffuse network of commercial and non-commercial users.

A personalization of the style of the moodle interface to adapt it to the usability recommendations and users requirements, has been carried out. Implementation is on progress, but we have already done important adaptations on the SeniorLearning platform.

## CSS Style Sheet

Taking into account the usability recommendations, the first adaptation that we carried out was to modify the default aspect of the Moodle platform. Now, we are going to summarize the most important changes that we made in the CSS Style Sheet:

- Create a new theme for all the platform. This theme modifies the default colours used in Moodle. We decided to use a blue palette combination.
- We modify the header of the platform, introducing our logo.
- We increase the size of the logos, to ensure that people can see them clearly.
- Use a Trebuchet sans serif typeface (Arial, Verdana, Helvetica etc.) that is not condensed.
- Use 12 point type size for body text and 18 point type size for the headers or 14.
- Present body text in upper and lowercase letters.
- Reserve underlining for links.
- Left justified text is optimal for older adults.
- A home button it is presented on every page.
- The content of the course is divided in very small sections to avoid the concept of scrolling, because older adults, who are novices to computers, often don't know this concept.
- We use explicit step-by-step navigation procedures to ensure that people understand what follows next. For this reason, in each page we incorporate at the top and the bottom of the page a link to the next and previous steps.
- We also use a single mouse click to access to the information.
- We use a standard page design and the same symbols and icons throughout the learning environment.

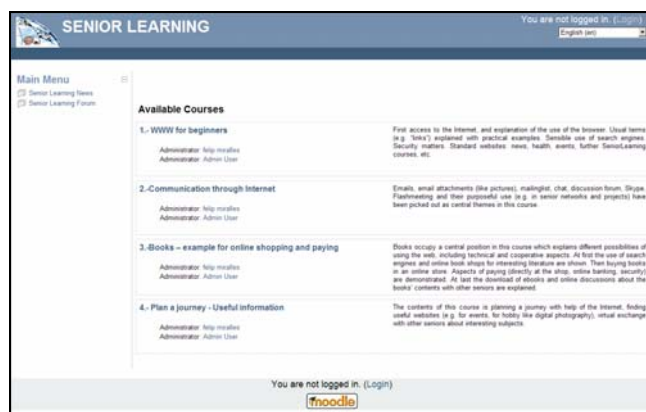


Fig. 1. SeniorLearning Syle Sheet

## Login Page

We also edapted the default login page, because it contained too much useless information and options that might confuse senior users. The SeniorLearning login page, only present at the centre of the page the option to introduce the user name and password, like the next figure shows:



Fig. 2. Senior Learning login page

## Content Distribution

Moodle usually presents the content in three columns. The right and left columns are used to set different activity or announcements blocks, and the central part is used for the content.

We decided that is more usable for the users, only have to columns, the left one for all the general blocks, and the central one for the course content. So the aspect of the content of one course that we implemented is:



Fig.3. Content of one course

## Roles

We are working to have a collaborative version of the SeniorLearning platform, using roles and writing Guidelines for Peer Tutors, which will include instructions of how to moderate a course and proposing activities for each course.

In order to obtain the collaborative capability, the SeniorLearning platform hosts different roles to be assigned to users, where each role has different capabilities and permissions. These roles are:

- **Administrator:** Administrators will be able to administer users, courses, languages, etc.

- **Course Creator:** Course creators will create new courses, and translate them to different languages.
- **Peer Tutor:** Peer Tutors will moderate classrooms, forums, will post activities and grade or provide feedback to students.
- **Student:** students will sign up and learn contents of courses.

## CONCLUSIONS AND FUTURE WORK

Taking into account the requirements of the project, and all the usability recommendations, we have set up an online alpha version of SeniorLearning platform. This version is really available online to be tested by partners and final users, with the purpose of improving the platform during the remaining of the project.

Once we validate the usability of the platform and the content of the courses, one of next steps is provide the courses content in many different languages. It is easy to administer that, because SeniorLearning platform is ready to support multi language.

We also want to provide a collaborative version of courses, and this implies to separate the content in classrooms, each one of them directed by a peer tutor, who can guide the users in the learning process. We will also introduce workshop activities and Guidelines for Peer Tutors, to help the instructors to lead courses and figure out if students are really assimilating the content of each course.

So SeniorLearning project is still on progress. We intend to reach at least the objectives that were initially proposed, but more important than this, we intend that SeniorLearning becomes a reference in the complex task of teaching the Internet through e-learning to a special target audience, senior citizens, that have become one of the most important target groups in all inclusion programs. The purpose of the project is two fold: to deliver the first multilingual learning environment for seniors which teaches tools and resources of the Internet, to be hosted in [www.seniorlearning.eu](http://www.seniorlearning.eu) ; to deliver a formal set of recommendations and good practices of what we will have learned during this development.