Designing ICT-based Learning Scenarios for Special Target Groups
- Meeting Senior Learner Needs -

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Abstract
Demographic changes and the growing importance of lifelong learning to support the employability of the ageing workforce demand for the consideration of learning programs designed according to the specific needs of older learners. In this context especially the use of Information and Communication Technology for training senior learners seems a fruitful path to follow. A learning approach based on self-guided learning activities that focus on the collaboration between learners is especially welcomed by senior learners. Practical experiences made in the framework of the ICT4T project suggest that Learning Management Systems like Moodle offer a number of tools that can support a learning approach appropriate in senior learning, if adapted to the target group's needs from a didactical and usability perspective.

Background

The structure of the European society is subject to demographic changes. Due to a higher life expectancy and a decreasing birth rate, the average age of the European population is growing steadily. Especially the age group 65+ will increase during the next 20 years (European Commission, 2005). This development results also in an ageing workforce and lifelong learning is seen as a key to maintain the employability of senior citizens (Federal Ministry of Education and Research – Germany, n.d.). In the framework of the Lifelong Learning Programme (LLP) initiated by the European Commission the use of Information and Communication Technology (ICT) is promoted as a factor for the facilitation of continuous training and education (European Commission, 2008). In this context considering the specific needs of older people in designing supportive ICT-based learning scenarios is a challenge which needs to be addressed by trainers and training institutions throughout Europe.

The ICT4T project (http://www.ict4t.net, funded by the Socrates Grundtvig Programme of the European Union) aims to support the competence development of training institutions and trainers who work in the field of training older adults by using ICT. Therefore, in the frame of the ICT4T project an online train-the-trainer course was designed to showcase appropriate use of ICT for the target group of senior learners. By participating in the online course trainers themselves have the chance to acquire hands-on experience of ICT-based educational design for this specific target group. Based on the awareness that the target group of senior learners can be very heterogeneous the 8 course modules cover issues like web-accessibility, basic learning theory, ICT-tools for learning and corresponding learning activities as well as teacher roles. The course ends with a course design project where groups of participants are supposed to design their own courses for seniors putting into practice what they have learned in the previous modules of the course.

The ICT4T training course was offered three times as an online course between March and June 2008. All in all about 50 trainers and experts working in adult education from all over Europe took part in the courses. Although most course participants were younger, some belonged to the age group 50+.

In this paper pedagogical models and learning approaches appropriate for the target group of senior learners are briefly outlined in the first part of the paper. Following these theoretical considerations on senior learning, practical experiences from implementing the ICT4T online courses based on these concepts are introduced.

Pedagogical Approach for Training Senior Learners

Target Group Characteristics

The group of senior learners can be considered very heterogeneous. Especially, broad definitions as referred to by the term 50+ include several age groups and diversity in personal interests, competences, physical fitness, life situations, or the general learning motivation. This heterogeneity requires a flexible design of learning programs for this age group. In any case, the learners' prior knowledge and the establishment of appropriate links to existing experiences of learners need to be taken into account for pedagogical approaches suitable for training seniors.

With regards to ICT competences a transition within the age group 50+ can be perceived. Average ICT competences of this group are rising steadily as it is joined by more and more people who have experience with ICT gathered through their profession or through trainings. However, internet usage statistics from Germany (TNS Infratest & Initiative D21, 2007) show exemplarily that the number of people aged 50+ who use the internet for any reason and independent of any location is still far lower than within age groups of younger adults. While 77,1% of the age group 30-49 used the Internet in 2007, only 35,4% of the age group 50+ was online in Germany. A further sub-division of the group 50+ shows, however, that 58,3% of the age group 50-59, 35,5% of the age group 60-69 and only 13,2% of the age group older than 70 were online (TNS Infratest & Initiative D21, 2007). This again points to the heterogeneity of the age group 50+ with regard to the use of the internet and essentially suggests that one should be careful in making general assumptions for such a large group of people.

Pedagogical Approach

The following aspects formed the conceptual basis for the pedagogical approach of the ICT4T train-the-trainer course. They indicate a series of elements that are considered successful in learning for the elderly (Kearney, 2007):

- Self-guided learning: Course structures need to be flexible enough to allow older learners to "set their own agenda within the framework of the course" (p. 1) and trainers need the competences to support the learners to mange their learning objectives.
- Participatory course design: Senior learners are generally quite aware of their learning objectives, and by actively involving senior learners in the process of course design the course can be tailored to their expectations.
- Informal learning: Learning that has not been planned for and is rather based on an ad-hoc spontaneous approach is often more welcomed by senior learners than learning that has been highly structured in advance.
- Reflection activities: Reflection activities – especially those which demand for collaboration and interaction with other learners – are considered positive by senior learners because this gives them the possibility to construct their own understanding of a subject matter.
- Active learning: Problem-based learning based on small learning projects is welcomed by senior learners. Learning by doing constitutes a fruitful learning experience for them.

This pedagogical approach for training older people points to some characteristics that should be considered in designing learning scenarios according to senior learner needs. A built-in flexibility in the learning process and opportunities for learners to determine their own pathway through the course are essential. An example for such flexibility would be the provision of different avenues to the same learning content, e.g. in terms of the complexity level. Tasks should require active participation, and learning processes need to be based on interaction among learners. Held et al. (2006) refer in this context to the application of socio-

constructivist and informal learning approaches, including continuous feedback processes for the learners to support self-guided learning. Additionally, the authors point to the importance of providing small portions of learning content with a possibility to actively try out what should be learned, considering learners' experiences and prior knowledge.

The concept of collaborative knowledge construction takes into account both the interaction between participants and the importance of learners' experience, and can therefore be seen as appropriate for training senior learners. Fischer, Bruhn, Gräsel and Mandl (2000) point out that research in this area refers to collaborative knowledge construction as the central aspect of collaborative learning as opposed to individual learning approaches. Through discussion of a problem from different perspectives – based on the learners' prior knowledge and experiences – an advanced solution to a learning problem is found collaboratively.

These ideas also build on the concept of "knowledge-building communities" introduced by Scardamalia & Bereiter (1994) in the context of computer-based education. The concept refers to groups of people which actively produce new knowledge in a social and collaborative discourse process, resulting in a in a jointly created outcome representing more than a pure summary of individual inputs. The related "knowledge-building discourse" is problem-based, has a focus on collective knowledge and understanding and takes the broader knowledge community into account.

In the following, the application of this pedagogical approach will be considered in the context of ICT-based educational design. The subsequent chapter builds on practical experiences made in the implementation of the described approach in the ICT4T courses.

Implementing the Pedagogical Approach in Designing ICT-based Learning Scenarios

Whereas the above mentioned pedagogical approach is applicable to training older people in general, the use of ICT in senior learning demands the consideration of additional aspects in educational design. The central idea behind the ICT4T online course is to enable trainers to have a first-hand experience of ICT-based pedagogical approaches appropriate for training older people. During the online course the trainers made this experience from the learner point of view (e.g. through simulation activities) and reflected on it in discussions with the other participants and tutors.

Commonly, the use of ICT in learning scenarios needs to be relevant to the learning activities and provide an improvement as compared to learning without the use of ICT. However, for older people, this factor is even more important than other advantages carefully designed ICT-based learning scenarios can provide; e.g. the improved access to learning opportunities independent of temporal and geographical restriction (Kearney, 2007). According to Ala-Mutka & Punie (2008) the application of ICT in learning can improve the flexibility of learning and provides possibilities for the interaction and knowledge sharing which is preferred by senior learners, especially if learning refers to their every day life.

In the framework of the ICT4T project the open source Learning Management System (LMS) Moodle (http://moodle.org) was utilised for the online course implementation. The main reason for choosing Moodle – besides the fact that it is free open source software with a large user community – was that the concept behind the LMS is very much based on a collaborative approach towards learning, which is also reflected through the standard learning tools of the LMS (Dougiamas & Taylor, 2003; Höbarth, 2007). Furthermore, the course environment meets basic standards of web-accessibility if used appropriately (McNaught, 2006; Reich, Petter, Helling & Müller, 2007). This was also of certain relevance since web-accessibility forms an underlying theme of the course.

The ICT4T course was designed as a series of learning activities (Kearney, 2007) which focus on interaction between participants and require active contribution and reflection of the content. For this reason collaborative tools offered by the LMS play a central role in the online course. They are primarily meant to serve the purpose of joint knowledge construction, whereas the learning materials provided (e.g. text, video) serve more as a trigger for collaborative and reflective activities. As described above, the LMS Moodle provides several tools to support collaborative learning (e.g. discussion forum, wiki, chat), and each learning

activity requires the use of at least one of these tools. Especially the forum was appreciated by participants of the course as a means for discussing course contents and ideas related to the general theme of training senior learners. The discussion process was moderated by the course tutors through summarising important aspects and encouraging further discussion on relevant issues. Additionally, reflective learning was supported by providing learners with the possibility to monitor their own learning progress in an e-portfolio. Besides the mentioned tools the LMS Moodle offers, an external online mind-mapping tool (Mindmeister, http://www.mindmeister.com) was used for structuring purposes and a visual presentation of ideas. This tool was primarily used for learners' reflections. Learners were supposed to document their learning progress within each module with the help of the mind-mapping tool. Eventually the mind-maps were uploaded to their individual e-portfolios and made accessible to the tutor and other learners.

Although the course design focused on an approach of self-guided learning, the course was pre-structured in a way to support learners in their learning process and provide them with a clear orientation within the course. Each module and the corresponding activities had the same structure to facilitate the recognition and orientation in the online learning environment. A rough estimation of the timing was provided for each activity to support the coordination of collaborative activities. The overall course structure needs to be considered from two perspectives: a *didactical* and a perspective which takes into account the *usability* of the virtual learning environment.

From a *didactical perspective* learners were supported by the provision of clear information about the objectives, intended outcomes and assessment procedure of each thematic module. Additionally, for each of the related learning activities again the objectives and assessment procedure were described. Furthermore, a clear task description ("What do I have to do?") was given for each activity and the tools (e.g. forum, wiki) and resources (e.g. presentation, video) were grouped together with the respective activities. Based on their own interest, learners also had the opportunity to access materials including additional information and further details on the topic of each activity. Support was provided by tutors who moderated forum discussions and provided summaries which were structured according to the learning objectives of each module.

From a *usability perspective* the main aim of the course implementation in the LMS was to strip down navigation as much as possible and to come up with a consistent learning environment. This also included the hiding of all irrelevant functionalities of the Moodle navigation from the learners. Additionally, default links of the Moodle navigation structure had to be hidden to ensure that learners could access the Moodle collaboration tools and learning resources only from within the relevant learning activities. Figure 1 shows a screenshot of the ICT4T online course with its simplified navigation structure. The navigation blocks on the left side display only the most important links (e.g. home page, a general module description including learning objectives, the e-portfolio, logout). The breadcrumb menu at the top indicates that the learner currently views the site "Module 3 Activities". By clicking on the navigation buttons in the central table of this site learners can directly access each activity, including the different Moodle collaboration tools as indicated by the type of activity. Each activity opens in the same window, however, as the left navigation blocks remain the same a return to this overview (by clicking on the "Module 3 Activities" button) is always possible.

Figure 1. Screenshot ICT4T online course.

Taking into account that learners in general might be new to the use of online environments for learning, and that designing a consistent navigation structure in Moodle is subject to certain restrictions (e.g. the left side navigation blocks cannot be displayed on the pages of the Moodle tools such as forum, wiki, etc), a help section was provided on the start page of the course. This help section contained a collection of screencast videos which were produced to demonstrate the structure and navigation path of the ICT4T course as well as the basic functionalities of the Moodle collaboration tools needed to complete course activities. Needless to say the tutor also played an important role with regard to supporting learners. Especially at the beginning of the course, several requests by learners about technical problems were sent to the tutors by eMail. These requests ranged from login problems to difficulties in the browser setup for the use of flash-based applications.

Conclusions

In the framework of the ICT4T project three online courses have been offered to a European audience. The courses aimed to showcase the appropriate use of ICT for training seniors. A preliminary analysis of the results collected from the participants of the three online courses and feedback provided to the course tutors by eMail suggest that the participants appreciated the course in general. Through the involvement of mature learners in the courses valuable inputs on the possible improvement and further development of the ICT4T course could be gathered also from a senior learner perspective.

From a didactical course perspective participants evaluated the clear structuring and description of tasks and activities positively. Especially, activities designed around the usage of ICT tools and learning activities to be applied in senior learning were among the most relevant issues for the participants. Possibilities to actively test such tools (e.g. Skype) in collaboration with other participants and course tutors were welcomed by participants. Several participants pointed out that – in addition to the materials and related tasks provided in the course – their learning progress was supported by mutually sharing their existing experiences in training senior learners as well as by sharing their technical knowledge in the use of ICT in general. The supportive climate that developed during the course runtime was especially valuable when some participants faced technical challenges.

Looking at the usability perspective of the course design, as much simplification as possible was considered in developing the navigation structure of the online course. However, as described above, the application of consistent course navigation was somehow limited by the

available design possibilities of the LMS Moodle. Nevertheless, this resulted in a valuable learning experience as the following forum post of one participant suggests: "*I have also had problems with navigation, jumping back and forward, and forgetting how to access yesterday's pages. But now I can appreciate much more how senior learners feel when they come up against the same kind of problems*".

To sum up, the participants of the ICT4T online courses had the chance to experience ICT-based pedagogical design for senior learners, looking at its advantages as well as challenges. The didactical pre-structuring, the adaptation of the Moodle navigation, the resources of the help section and continuous support by course tutors provided the course participants with the guidance also senior learners would need in an online course to ensure successful collaborative knowledge construction. Although only some of the trainers who participated in the ICT4T course were seniors themselves, all participants could benefit from the application of the pedagogical approach for senior learning. This implies that the pedagogical approach as described in this paper is of certain relevance for training adults in general. Nevertheless, ICT-based educational design for senior learners demands from trainers to carefully consider the challenges that result from working with the very heterogeneous group of learners aged 50+.

Acknowledgement

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