

ICT and Lifelong Learning

Dr. Dejan Dinevski, Ass. Prof.
Head of Department of University Information and Technology Development
University of Maribor
Slomskov trg 15, SI-2000 Maribor, SLOVENIA
e-mail: dejan.dinevski@uni-mb.si

Dr. Peter Kokol, Prof.
Faculty of Electrical Engineering and Computer Science
Smetanova 17, SI-2000 Maribor, SLOVENIA
e-mail: kokol@uni-mb.si

Abstract

"Technology can make lifelong learning a reality" is written in one of the listed references. The concept of lifelong learning in the EU member states differs significantly and their efforts seem to be partly mismatched. Even in different concepts the modern information technology support is becoming the foundation of the efficient and cost-effective lifelong learning.

The e-learning technology is becoming progressively sophisticated, which has several positive effects, though on the other hand the complex technology makes some learners feel uncomfortable. Innovations in e-learning information systems should take special care of this effect when dealing with "lifelong learners", since the level of the information literacy in this group varies a lot. A good example of the technology innovation is personalization which makes e-learning systems friendlier and diminishes the well known technology barrier.

Key words:

Lifelong learning, E-learning, Personalization

1 Introduction

The related terms of »lifelong learning« and »university continuing education« both describe very broad ideas. They are consequently very expansive and not consistently defined. In fact the problem is that there are too many definitions of the terms including the ones from UNESCO, Council of Europe, European Commission, EUCEN (European Universities Continuing Education Network) etc.

In our context the most relevant definition for "lifelong learning" (LLL) is the one from European Commission [1] which says that it is "all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective". This includes all forms of learning: formal (courses and examinations), non-formal (without examinations) and informal (without either courses or examinations). In this policy document the concept of "European lifelong learning area" (which mirrors the earlier one of a European research area) is the area where citizens can move freely to "learn, work and make the most of their knowledge and skills to meet the aims of the EU to be more prosperous, tolerant and democratic".

For the "continuing education" (CE) we will refer to EUCEN [2] which states that it is "any form of education, both vocational or general, resumed after an interval following the continuous initial education". This includes: full-time and part-time programmes for older adults leading to qualifications; courses taken for vocational reasons or for love of the subject; courses leading (but not necessarily) to credits, diplomas and degrees; courses taken by graduates (but not always so). The definition is rather hazy, but it has been generally used by the authors describing the continuing education in Europe. On the other hand the term "university continuing education" (UCE) is not frequently used in the EU official documents where lifelong learning is used instead (in almost identical meaning). Synonyms for general understanding of continuing education are also "adult education" (used for example in Finland) or "permanent university education" (used in Spain) and also "post-experience education". Almost all agree that UCE is education for adults returning to university education after a break following their initial education but sometimes it is limited to vocational educational activities.

In fact lifelong learning in its definition covers the whole education area: initial education, basic continuing education and university continuing education.

2 Information technology and Lifelong learning

"Technology can make lifelong learning a reality" [5] is in a nutshell presented the North American point of view. With electronic tools, people can (theoretically) learn virtually anytime and anyplace they choose without obstacles in place, time and social status.

UNESCO's "Policy Paper for Change and Development in Higher Education" urges higher education institutions to make greater use of the advantages offered by the advancements of communication technologies so that "each university should become an open university offering possibilities for distance learning and learning in various points in time" [6]. The e-learning is not seen as a shift from the traditional to open learning, but rather as a support to conventional learning processes with the use of modern information technology and distance educational methods. Modern implementation of e-learning in educational institutions can be considered as the result of the convergence process of distance and conventional education.

As recent reports demonstrate clearly, the pace of e-learning and ODL is accelerating, and it is likely to take a growing share of higher education. According to the cited UNESCO report [6] open and distance learning is one of the most rapidly growing fields of education, and its potential impact on all education delivery systems has been greatly accentuated through the development of ICT – based technologies, and in particular the World Wide Web. E-learning at the tertiary levels shows a two-track development pattern. On the one hand, numerous open universities have emerged to absorb large numbers of new learners, while, on the other hand, increasing numbers of traditional universities have begun to offer their programmes also through distance education. The development of new information and communication technologies has reinforced this trend.

In the book where the role of "Net Generation" is explored [7], the new ways of learning for the new generation are presented.

The new learning process brings up the following shifts:

- from linear to hypermedia learning,
- from instruction to construction and discovery,
- from teacher-centered to learner-centered education,
- from absorbing material to learning how to navigate and how to learn,
- from school to lifelong learning,
- from one-size-fits-all to customized learning,
- from learning as torture to learning as fun, and,
- from the teacher as transmitter to the teacher as facilitator.

Tapscott's research leads him to conclude that the "Net Generation" is a force for educational transformation. They process information differently than previous generations, learn best in highly customisable environments, and look to teachers to create and structure their learning experience. Furthermore, the importance of understanding the behavioral patterns of the network generation exceeds merely appreciating that they are comfortable working online. A crucial element for successfully delivering virtual courses entails transforming the educational experience so that it is meaningful to the information-age learner.

Due to the overall development and wide implementation of e-learning and because of high number of students that will participate in LLL it is evident that e-learning is going provide technical foundation on which efficient LLL will be built. Nevertheless, to come to this point the e-learning has still to become inexpensive, user friendly, actively motivating, multimedia supported and widely accessible.

2.1 E-learning technology features

"E-learning" can be seen as complete information technology support to learning processes. From the functional point of view there is a widespread acceptance that a "total" e-learning solution comprises the three key elements: Content, Technology and Services.

If one considers the now thousands of vendors that have entered into, this relatively new e-learning industry phenomenon, one will note that they invariably fall into one (or more) of the three categories - their core "product" will either be a content, technology or services e-learning offering.

Content adds to the knowledge, skills and capabilities of the human capital. Beside the "classic" classroom and published content the generic e-learning education and learning content (courses, events, resources, mentoring, etc.) is gaining the importance in the e-learning solutions. The trend of the learning content development is its interactivity, which forms a basis for the so-called "intelligent" learning modules. The intelligent representation of the content is trying to serve the learners with different background knowledge.

Services include:

- Consulting (Strategy and design of the e-learning programme)
- Support (assistance with implementation of the e-learning programme (launch, marketing and promotion, technology platforms and infrastructure, management feedback and reporting, technical and implementation support)
- Design and build services (build of custom content for the specific education, transfer existing materials to online format, tailoring and customization of the e-learning platform and delivery environment, and integration with other applications)

Technology comprises the:

- Infrastructure (Internet, Intranet or hybrid delivery platforms), facilities for offline and remote access, user interfaces and personalization and customization capabilities
- Learning content management systems (management of learning offerings - options for delivery, tracking, management and reporting of online content)
- Learning management systems (capabilities for skills dictionaries, competency definition and mapping, performance management, employee development plans, financial and activity tracking/reporting, integration with other systems)
- Learning technologies (mentoring, chat, forums, expert-led discussions, Web seminars, online meeting and virtual classroom sessions, etc.)

3 How can LLL benefit from technology and innovation in learning processes?

Users/learners of Lifelong learning services to be offered by universities and other educational institutions are expected to be mostly adults with different levels of background knowledge and different levels of ICT skills. Therefore it is crucial that LLL e-learning platforms are built on friendly, easy to use and robust technology. On the other hand the didactics will have to be designed in a such a way that the learning process is motivating for the learner, that it supports the information age generation (constructivistic learning) and that it improves transfer of acquired knowledge in a learning process into a practice. As far as the high quality access is concerned there is a new technology coming up, namely the m(mobile)-learning which will make the learning possible practically anywhere and anytime.

In majority of e-learning programs offered today, the burden for learning is placed wholly on the shoulders of the learner. When "e-students" go to a course web site, they enter a menu of activities: announcements, documents, assignments, external links, communications, and tools. Students are expected to navigate through this material on their own, without much support. They are generally offered email links (to faculty and other students, to more material, etc.), but not much more. "Collaborative learning" is trying to solve this situation by creating a virtual social space for the teaching and learning needs of the particular group of people inhabiting that space. This space has to be managed. Such a common space is very important for the motivation and effective learning of UCE students that lack the social component of traditional student's environment. Such a system also allows for something that is often overlooked in the e-classroom: recognizing and acknowledging the most valuable contributors. All these qualities are beneficial to the adult learner who is using the ICT as the means of interaction with the educational institution, teachers and fellow students.

As far as technology aspect is concerned the e-learning support is being upgraded with new features. We believe that the personalization of the e-learning services is going to play an important role in the friendliness and intimacy experience of the participants.

3.1 Personalization of the e-learning services

The necessary technology development itself seems to make (some) learners feel uncomfortable. The variety of new technology features, services and functionalities may limit rather than stimulate the critical motivation in learners.

The personalization of the technology platform offers the learning organizations a method for enhancing the learners' intimacy through their ICT services, which is, without any doubt, an additional motivation factor for the learner to whom the computer represents a major learning media. The technology providers will be forced to offer both highly sophisticated and at the same time "simple to use" e-learning functionalities. One of the major solutions to combine these two directions is the personalization of the e-learning technology platform.

In February 1999, the Gartner Group stated that, "matching direct or inferred reader requests through content personalization will be the most dramatic development in the Internet ... through 2002, and will help differentiate the Web as a new medium." Clearly this is an important technology, and is being applied in many Internet systems in use today. Recent studies, for example [8] report that compatibility, ease of use, and trialability has a significant impact on the intended use of the personalization features on a web site. On the other hand visibility, image and result demonstrability were found not to have a significant impact on intent to use the personalization features on a web site. The study also found that the personalization features should be easy to use and should exhibit some advantage to the users to ensure adoption and use.

Three aspects of a Web site affect its utility in providing the intended service to its users. These are the content provided, the layout of the individual pages, and the structure of the entire Web site itself [9]. The relevance of each of the objects comprising a Web page to the users' needs will clearly affect their level of satisfaction. The structure of the Web site, defined by the existence of links between the various pages, restricts the navigation performed by the user to predefined paths and therefore defines the ability of a user to access relevant pages with relative ease. However, the definition of relevance is subjective. It is here that there is a potential mismatch between the perception of what the user needs, on the part of the Web site designer, and the true needs of users. This may have a major impact on the effectiveness of a Web site.

Development of the personalization aspects and techniques has been very fast in recent years, yet the basic goal of personalization systems remains the same: to provide users with what they want or need without requiring them to ask for it explicitly. Personalization is the provision to the individual of tailored products, services, information or information relating to products or service. It is a broad area, also covering recommender systems, customization, and adaptive Web sites. However, real time personalization will most likely be required in order to sustain a competitive advantage through the use of personalization technology. Real time personalization reacts each time the user clicks the mouse, generating only relevant content for the user. A major role in the e-learning portals will also play the location facility and the notification service that do not depend on the devices, protocols and on the type of access. This also means an upgrade of e-learning to m-learning (mobile learning) which is becoming a reality nowadays.

3.2 Personalization technology

Personalization technology involves software that learns patterns, habits, and preferences. Personalization is a toolbox of technologies and application features used in the design of an end-user experience. Features classified as "Personalization" are wide-ranging, from simple display of the end-user's name on a Web page, to complex catalog navigation and product customization based on deep models of users' needs and behaviors. Similarly, personalization technologies range from commonplace use of databases, cookies, and dynamic page generation, to esoteric pattern matching and machine-learning algorithms, and data mining [10].

As far as the technological process is concerned, personalization can be considered a three-step process in which customer information (their preferences, behavior, and profile) is taken as input, business rules are evaluated, and customized content is generated as output [11].

When developing a complete e-learning technology solution (model, software and portal), presented in [12] we proposed and implemented some personalization features that are especially appropriate for e-learning systems. In details the personalization itself is presented in [13]. Some special features of the personalization of e-learning services are presented in [14]. Let's just mention the ultimate goal that should be to achieve personalization without or with little user intervention as possible with tracking their usage data.

We will not go further into technology details in the scope of this paper; they are presented in cited references. We developed the personalization technology at the University of Maribor and University of Primorska, and made an application in the e-learning portal (which is also product of the University of Maribor). We believe that personalization itself will be one of the technological innovations that will strongly support extensive lifelong learning application based on the information technology.

4 Conclusion

It is more or less evident that the lifelong learning in general and the university continuing education will experience the consistent expansion in the future. Lifelong learning has a very high priority in European policies and action plans. At the present time there is a lot of terminology differences and variety of concepts in Europe but on the other hand it seems that EU will solve problems in diversity of models and statistics data with common actions within the European area of lifelong learning. There is practically no doubt that the foundation of LLL provision is going to be the information technology and e-learning together with the emerging m(mobile)-learning technologies.

While the personalization is widely accepted in business and service oriented portals, it is less used in e-learning. The fact is that personalization makes the e-learning systems friendlier and can (when implemented properly) significantly diminish the technology barrier effect of the learner's access to the e-learning processes and e-educational institutions. Through the personalization, the learning organizations can help learners to become more familiar – and hence more comfortable with new technology features which is an important achievement in the lifelong learning provision.

References

- [1] European Commission, Making a European Area of Lifelong Learning a Reality, COM Brussels, Commission of European Communities, 2001, p. 9
- [2] Osborne, M. (ed), Thoma, E. (ed), Lifelong learning in a changing continent, NIACE, England and Wales, 2003, p. 4
- [3] Coffield, F., Breaking the Consensus; Lifelong Learning as Social Control, British Educational Research Journal, 25, 4, pp 479-99, p. 487
- [4] Taylor, R., University Liberal education; a "Great Tradition"?, Adult Learning, 1990, Vol 1, No. 9, pp. 243-245
- [5] Regan, E.A., Lifelong learning and performance: Linking academia and Business, Office Systems Research Journal, Springfield 1998, Vol. 16, Iss. 2, p. 43
- [6] Moore, M.M., Tait, A., Open and Distance Learning – Trends, Policy and Strategy Considerations, UNESCO Division of Higher Education, Paris 2002, (p. 88).
- [7] Tapscott D., Growing Up Digital: The Rise of the Net Generation, New York: McGraw-Hill, 1998.
- [8] Greer T. H., Murtaza M. B. (2003), Web personalization: The impact of perceived innovation characteristics on the intention to use personalization, The Journal of Computer Information Systems. Stillwater: Spring 2003. Vol. 43, Iss. 3; pg. 50
- [9] Mulvenna M. D., Anand S. S., Buchner A. G. (2000), Personalization on the Net using Web mining, Association for Computing Machinery. Communications of the ACM. New York. Vol. 43, Iss. 8; pg. 122
- [10] Kramer J., Noronha S., Vergo J. (2000), A user-centered design approach to personalization, Association for Computing Machinery. Communications of the ACM. New York. Vol. 43, Iss. 8; pg. 44
- [11] Votch V., Linden A. (2000), Do You Know What 'Personalization' Means? Gartner Group Research Note, May 18, 2000.
- [12] Dinevski D., Ojsteršek M., Plenkovia M. (2003), Information technology platform for e-learning implementation. The 10th International Scientific Conference, Opatija, 28th-30th June 2003. Society and Technology 2003, Rijeka: Sveučilište, pg. 148-158.
- [13] Horvat B., Ćajia Z., Ojsteršek M. (2002), Personalizacija in spletno rudarjenje. Conference ERK 2002., Ljubljana: IEEE Region 8, Slovene IEEE section, zv. B, pg. 229-232.
- [14] Dinevski D. (2004), Personalization of the e-learning systems in the service of the learner, The proceedings of the Third EDEN Research Workshop, march 2004, Bibliotheks- und Informationssystem der Universitaet Oldenburg - Verlag, pg. 536-542