Editorial: Technology and Lifelong Learning

Last year, I decided to edit this special issue because Technology and Lifelong Learning is the topic of our new five-year RTD programme at the Open University of the Netherlands’ Educational Technology Expertise Centre. This editorial begins by explaining why we are focusing on the development of new technologies to foster lifelong learning. This background information will help readers understand their importance and why the topics addressed by this special issue have been selected.

The new RTD programme is called 'Learning Networks for Lifelong Learning' and it grew out of discussions concerning our previous RTD programme, which focused on 'Competency-Based Learning in Distributed Learning Environments'. One of the outcomes of this programme was the Educational Modelling Language, an XML-based language that can be used to describe units of learning in formal terms. A unit of learning can be all kinds of learning opportunities, not only formal structures such as courses and lessons, but also various informal learning events. EML can describe these different units of learning in a way that can be interpreted by computers. It resembles a recorder that records courses and other learning events in a code that can be replayed by any machine able to interpret it. Units of learning and the underlying learning objects and learning designs can be shared and reused within communities of learners and learning providers. Our work on EML has provided the input for the IMS Learning Design (LD) specification, which is now an open standard for describing interoperable units of learning.

One of the basic aims of EML and LD is to enable us to abstract the different learning design approaches into a meta-language that will represent and allow the interchange of practically any learning design. While we were developing these languages, our criticism of most e-learning standards and e-learning courses was that they were implicitly or explicitly biased in upholding certain old-fashioned ideas about teaching and learning with technology. Most prevalent was the idea of a virtual classroom in which learning is considered synonymous with consuming knowledge in digestible and organised chunks prepared in advance by a specialist in the field. In this vision, the teacher's task is to select and arrange these chunks, to provide support and to test the progress of the learners. The upcoming learning technology standards (e.g. SCORM and LOM), and the learning management systems based on them, do not take into account at least three important factors that are driving the use of new technologies in learning. The first factor is that new Internet technologies can support completely different kinds of learning than was possible only a decade ago. Learning facilities are accessible everywhere and from different sources at any time. This forces us to think about different models for the adequate support of learning which – at the very least – complement classroom-based teaching. The second factor is that our current knowledge-based society demands a different attitude towards learning and the provision of learning: learning is no longer tied to the school and university context, but is lifelong, more integrated into work and other life contexts, and combines different formal and informal learning activities. The consequences of this for the way in which the educational and training landscape is organised can hardly be underestimated. Finally, the introduction of social-constructivist principles of learning has brought about fundamental changes in the way learning and teaching are conceived. Examples of these new approaches are collaborative learning, the use of learning communities, and new assessment methods based on the principle that assessment should be authentic and integrated into the learning process. These new approaches focus more on the process of learning (the learning activities) than on content. However, it was our experience that the field of e-learning standards remained more interested in the sharing and organisation of learning content, rather than in supporting new ways of learning by focusing on the learning process.

Once we developed the Educational Modelling Language to overcome these limitations, and once we had promoted its standardisation in the form of IMS Learning Design, we asked ourselves what the next step would be to improve learning by using new technologies. In discussing this issue, we realised that two things were really at the centre of our work: first, the establishment of networks of distributed collaborating learners, teachers and institutions; and second, the issue of lifelong learning. These concerns formed a sharp contrast to approaches focusing on solving the problems of a single teacher or a single institution. The whole idea of standardised learning activities that can be shared implies the existence of a network, and the idea of interoperable portfolios implies lifelong learning. It must be noted however that we do not see this as replacing mainstream approaches based on the virtual classroom, but rather as a broader perspective in which the virtual classroom is a special case. This also means that it is certainly possible to use IMS
Learning Design to create a course for a single learner in a specific setting, but that you can also do much more from the perspective of sharing within a community of lifelong learners.

The idea behind our new RTD programme is that lifelong learning can be stimulated by developing and using adequate standards-based technologies to support and join up people into networks in which they share knowledge and build competencies. The key issues here are: how can we connect distributed people in a safe, secure and stimulating way; how can we create, use and share units of learning; how can we navigate through the network given a large number of formal and informal learning opportunities; how can we position learners in a learning network; and how can we assess and support learners in the management of the learning process (e.g. by using software agents).

In this special issue, we hear from several authors who are able to answer these questions, at least in part. We acknowledge that these topics are still quite new. Although there has been a great deal of research in the field of lifelong learning in recent decades, and quite a bit of research on learning technologies in a variety of fields, the cross-section between the two is unexplored territory. For instance, when preparing our book review section, we found almost no literature covering this specific area. And so the articles presented here reflect the state-of-the-art in the field; they all describe explorations, first models or case studies.

The first article, by Friesen and Anderson, starts by describing and analysing the situation of a lifelong learner. The authors argue that lifelong learning is an eclectic concept, embedded and holistic in nature. Lifelong learning provisions must be available anytime, anywhere and in multiple formats. From the technology point of view, the authors explore how the semantic web can offer lifelong learning facilities that meet these requirements. They also explore the issues surrounding e-portfolios. The article identifies two directions for future research and technology development: a) the integration of semantic web principles and the work done in the learning objects and metadata field, and b) the development of standards to enable the secure and controlled interchange of portfolio data.

The second article, by Koper and Tattersall, analyses the requirements for establishing learning networks for lifelong learners. They argue that true support for lifelong learners revolves around distributed, evolving networks of learners and learning events. The support must embrace effective learning design and offer guidance to lifelong learners over long periods of time and across different life phases. Based on these requirements, the authors describe a formal model, in the form of a graph, for representing a learning network with activity nodes to which learners can go and share different study paths. They also propose an architecture identifying the core components and the relationships between the components within a learning network, and present some initial implementations of this architecture. Further research should focus on such questions as: how can software agents be used to perform learner assessment tasks? What techniques are suitable to position learners in learning networks? What measures stimulate active participation in a learning network?

The third article, by Allert, Richter and Nejdl, introduces the concept of 'second-order learning objects' as a means of fostering knowledge generation. The authors make a distinction between the reproductive and productive aspects of lifelong learning. In the reproductive approach, students are asked to consume the products designed and prepared by teachers. This approach is content-driven, as argued above in this editorial. In lifelong learning, learners are producers as well as consumers of knowledge and the resulting products cannot be pre-designed but emerge during the learning process itself. Second-order learning objects do not contain the knowledge, but rather the study tasks, the processes, and the learning strategy. They focus on the process. The authors discuss the modelling aspects of second-order learning objects as well as their implementation in a learning management system. They also emphasise the possibilities of the semantic web in this field.

The fourth article, by Mason, Pegler and Weller, deals with a key issue in lifelong learning technologies: e-portfolios as a form of multimedia, as an ever-developing CV. The authors define the concept of the portfolio and its different uses in learning: for developmental purposes, presentation purposes and assessment purposes. They specify the characteristics of e-portfolios and the standardisation aspects. They also discuss the use of learning objects and standards related to e-portfolios: ‘Adhering to standards allows these repositories (e-portfolios) to be re-usable over time, within different systems, conveniently accessible to different audiences as required.’ Furthermore, they present a case study in which e-portfolios are used for assessment purposes in a course; the aim was to produce a holistic course in which the pedagogy, learning
The object approach and assessment strategy formed an integrated whole.

The fifth article, by Van Bruggen et al., explores the issue of positioning learners in a learning network for lifelong learners. The basic question is how we can identify what knowledge and competencies learners already have, given the learning opportunities in a learning network. Doing so provides the basis for navigational support. As lifelong learning is self-directed, the authors state that learners, and not educational institutions, will have to be able to assess their position. In a learner-centred approach, positioning cannot rely on the direct mapping of learner characteristics onto the curriculum. A kind of intermediate layer of abstraction is needed. One of the problems, however, is that this idea can lead to the over-testing of learners and to an overload of work for the teacher. The authors then discuss the potential of technologies that use automated means to position learners, based on resources that are already available. They offer the example of Latent Semantic Analysis (LSA), and explore various LSA applications for positioning purposes.

In the final article, McAndrew at al. discuss the development and use of a knowledge network for lifelong learning. The idea is to implement a community of practice of self-directed learners who share knowledge within an organisational context. The authors describe the development and use of such a network at the British Open University, basing their discussion on three questions: who can contribute resources to such a system? What happens in practice? How is the community engaged?

To conclude this editorial, I would like to thank everyone involved in preparing this issue: Nick Rushby and Eric Deeson for their support, the reviewers, the authors, and Mieke Haemers, who provided secretarial support.

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