Competing in a "flat" world
Innovation and openness for lifelong learning

By Richard Straub

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The knowledge worker of the 21st century can no longer rely on the way learning was delivered in the 20th and preceding centuries. In fact, traditional education has seen little innovation since the inception of universities and schools. To address today's challenge of lifelong learning in new ways, technology will play a larger role by enabling and enhancing learning processes with speed, flexibility and individualisation.

In a technology-enabled lifelong learning environment, digital literacy will be a critical prerequisite for access and participation. This is especially important for age groups who may not have grown up with information technology – the so-called "digital immigrants" – as opposed to younger generations, the "digital natives". A term coined by Mark Prensky in his 2001 book with the same title.

Innovation and lifelong learning

In the universe of disruptive change and innovation, learning innovation is becoming essential. Learning's focus is gradually shifting away from primarily providing predefined skills and competencies towards dynamically enabling knowledge workers to be more productive. Yet, the actual challenge of learning innovation has been grossly underestimated during the last 10 years.

With the advent of "e-learning," some believed that the panacea for learning had been discovered. It was expected that technology, as such, would make the transformation of teaching and learning happen. However, technology is just one important element of an overall "learning system." It is simply an enabler – not the answer. A learning system encompasses several key elements and success factors that need to be in place to enable and support learning in an effective way. These include pedagogy, learning design, user-centric collaborative learning environments, and social and cultural factors. Without this holistic understanding of learning systems, technology will be leveraged in a sub-optimal way.

In a world of active lifelong learning, as promoted by the European Commission, an individual's skills portfolio will be built and documented based on a mix of real-life experiences, achievements and relationships, and formal learning certifications. While classroom-based learning will continue, especially in the early phases of education, it will play a decreased role during an individual's lifetime. Various studies report that 70 to 80 percent of what we learn is acquired on the job. In this sense, ePortfolio technology possesses the potential to transform current practice and improve the quality of lifelong learning, including continuing professional development.

As a result, the interest in learning innovation is moving from the mere "formal" towards the "informal" side of learning.

The current state of learning innovation

Over the past 10 to 15 years, many attempts have been made to drive education and learning innovation to a new level by leveraging technology. In the early stages of any major innovation cycle, many initiatives fail to stick due to the many players who develop unique point solutions.

Most of the issues encountered in this pioneering phase resulted from a lack of understanding of the complexity of the human learning process. The process of learning is infinitely more sophisticated and demanding than ordering books, airline tickets or tracking parcels over the Internet. Rather than expanding opportunities for learner-centric approaches, the early adopters often were confronted with rigid and inflexible learning provisions due to the inherent limitations of narrowly defined and constraining solutions. In addition, the use of proprietary technology evoked challenges with

interoperability, portability of content and scalability, all of which have subsequently slowed deployment initiatives.

After this initial phase of "trial and error," the situation changes with the emergence of a "dominant design". The idea of dominant design was developed by MIT's James Utterback and it refers to a more standardised way of applying the technology to key modes of learning – based on:

• A better understanding of the pedagogical and cultural challenges and opportunities; and

• Deeper insight into the change process, as well as in the required underlying ICT-infrastructure.

IBM describes these modes of learning as follows:

• **Formal learning** describes the traditional learning approach that facilitates the acquisition of knowledge and skills and uses a systematic, predefined process to achieve learning objectives. Today, formal learning increasingly includes a blend of instructor-led activities with technology support either in physical classrooms or online, in virtual classrooms.

• **Contextual learning (enabled learning)** takes place within the study or work context. It is about learning that is facilitated to address real-world questions and challenges that may require additional knowledge and expertise. It often leverages collaborative experiences at the workplace. Educational institutions tend to apply this form of learning (a.k.a., project-based learning) when a real-life work environment is either simulated or "conferenced in" via electronic links. Increasingly real-life projects are moving into the center of the learning process, requiring direct application of academic knowledge by students. The benefits of the construction of knowledge by the learner with this approach are broadly accepted.

• **Embedded learning** describes learning that takes place as an integral part of the workflow to facilitate the accomplishment of a specific task. At each step of a business process, modular learning can be developed to assist users who need help. This learning content is embedded in the process and

available at the time of task execution. It delivers targeted and measured guidance at the exact moment of need without interrupting the flow of work. It also allows the user to accomplish work through contextual learning delivered at the moment of task execution.

Technology enables all three of these approaches. Today, most companies and educational institutions use a range of technologies, including Learning Management Systems (LMS) or Learning Content Management Systems (LCMS) for formal learning. For enabled learning, mainstream communication, collaboration and social networking tools, as well as search technologies are being used. The primary technology used for embedded learning is Electronic Performance Support Systems (EPSS). While embedded learning is still in an embryonic stage today, it is clear that it holds a huge potential for dramatic improvements in managing workflows and key processes.

The learning society needs an open ecosystem for lifelong learning

The actual implementation and deployment of learning systems in Europe, as well as in other regions, are built on fragmented and largely incompatible technology foundations. The lack of broad-based interoperability is a serious roadblock for the fast development of learning societies. The current understanding of institutional autonomy motivates institutions at all levels to create self-contained technology silos. The effort to maintain and further develop these technology infrastructures drains valuable resources from areas of high value-add, such as teaching, learning and research towards commodity technology functions. Yet, the core competencies of most institutions don't reside in the field of technology management. Given the lack of critical mass for the individual institutions, this approach becomes very inefficient.

For lifelong learning to become effective and pervasive, a new ecosystem is required. An open ecosystem for lifelong learning is about cooperation, inclusiveness, transparency, multiculturalism, multidisciplinary approaches, connectivity and common standards. This new ecosystem will enable the large scale creation, distribution and sharing of knowledge. It will enable us to "connect the dots" to create new dynamics and synergies across our institu-

tions, businesses and government agencies. It will encompass public and private education providers, corporations, publishers and media companies, public services broadcasters, telecommunication providers and all sorts of new Internet-based service providers. While the precise shape of this ecosystem cannot be predicted, fundamental requirements can be established for it to be effective and to support the lifelong learning requirements of the various constituents.

In technology terms, openness translates into open standards and "service-oriented" architectures for learning. Open standards are subject to a transparent and collaborative development process and are not controlled by single players. Their specifications are publicly available and can be leveraged to enable interoperability. In this sense, open standards are the mortar holding the interoperable ICT ecosystems together. Reference architectures for learning provide the modular framework for a service-oriented implementation, ensuring interoperability and flexibility reuse, as well as technology neutrality. They allow managers to combine (i.e., mix and match or replace) components without the expense and expertise of custom coding connections between services components. Open standards also create the foundation for the broad-based deployment of open source software in education. While open standards and open source are different in nature, they share common ground – both result from a community oriented, collaborative process in which anybody can contribute and access the end product. However, while open standards are sets of specifications and interfaces, open source is software code. Proprietary standards, by contrast, are controlled by individual players and can potentially lock in users, sharply limiting their future choices and thus, substantially increasing the cost of ownership and innovation capabilities of ICT over time. Consequently, the question of standards and their openness becomes a fundamental question for governments as they implement the infrastructure to enable the learning society for the 21st century.

Fully interoperable and integrated work environments will facilitate work, learning and innovation on a broad basis. They will allow access to formal and informal learning resources and collaboration tools, as well as access to the information and processes required for future work portfolios.

Competing in a "flat" world (cont.)

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Based on government strategies and policies, educational institutions must lead the way towards this new, open ecosystem for lifelong learning. Educational institutions are currently bogged down with the increasing challenge of managing and sustaining their ICT systems. The lack of any critical mass for individual institutions to manage and improve their learning technology infrastructures drives cost up and impacts effectiveness.

Education providers must focus on their core business

To help education providers focus on their "core business" (i.e., high-quality teaching and learning, as well as research), the burden of technology provision must be alleviated. Today's fragmented model is doomed to fail with issues, such as spiralling costs, inadequate service levels, lack of specialised skills and the absence of viable longer term strategies. An open ICT ecosystem for learning can open the door for a new wave of innovation in education. It embodies important benefits, including:

- Serving as a basis for seamless interoperability;
- Ensuring technology neutrality;
- Allowing for maximum flexibility with regard to changing applications;
- Supporting innovation by creating a level playing field for providers;
- Driving costs down due to improved transparency and manageability of the system; and
- Creating a basis for sustainability.

Ultimately ICT provisioning can and should be largely detached from the individual institution, aggregated and professionally managed. The more fragmented the management of ICT, the lower the efficiency. Experiences with major corporations have shown that consolidation of fragmented ICT provisioning can result in savings of 20 percent and more of the overall ICT spending, depending on the specific situation. This is particularly relevant for the public education sector, where significant funding could be reinvested into the core business of teaching, learning and research.

Ideally, ICT could be provided to institutions as a utility, or a service. Despite the aggregation and centralisation of technology provision, this approach ultimately provides a higher degree of flexibility and adaptability for long term system evolution – if based on sound "service-oriented" reference architectures.

In their input to the Lisbon mid-term review earlier this year, the European eLearning Industry Group (eLIG) pointed out that the proper implementation of open ICT and e-learning standards is essential to foster the wide deployment of e-learning solutions. In order to create an interactive, interoperable learning environment for all, e-learning tools and services must be based upon open standards.

The call for action

Lifelong learning will not be transformed simply by infusing technology into our various learning processes. It is rather the creative **application** of technology in conjunction with all other key success factors for learning systems – culture, motivation, pedagogy and content – that will make the difference. As a result, true learning innovation lies in the fusion of deep insight into the human learning process with insight into the expanding technology capabilities.

To establish a sound "industrial strength" foundation for broad-based learning innovation urgent action is required by governments to:

1. Commit to open ICT ecosystems for lifelong learning. An open ecosystem for learning needs to be based on a robust and open ICT ecosystem. This will liberate energy and creativity where it is most needed: in combating the 21st century illiteracy. As Alvin Toffler has expressed, literacy in the 21st century will be defined not only as the ability to read and write, but increasingly as the capacity to learn, unlearn and relearn.

2. Develop a roadmap towards an open ICT ecosystem for education. Some European governments have already demonstrated moves in this direction.

3. Focus technology infrastructure strategies on aggregating existing infrastructures and on open standards-based capabilities to achieve critical mass. This will provide the flexibility and adaptablity to address rapidly evolving requirements. A foundation based on open standards will ensure vendor independence and application variety.

4. Strongly encourage and support the use of learning technology to enhance lifelong learning in support of their workforce development programmes. Active labour market policies will need to increasingly focus on technology support for learning.

5. Employ a utility model – that makes technology transparent and allows for the effective and efficient management of an infrastructure backbone – as a component of our national strategies to create a learning society.

Currently there's a critical juncture in the journey towards creating the 21st century learning society. While Europe's cultural diversity is a huge strength, its fragmentation of basic infrastructure is a serious weakness. The combination of a robust, industrial-strength technology implementation and an open standards-based ecosystem for learning will provide a sound basis for enabling innovation in learning.

This innovation will result in new pedagogical models, new virtual collaboration environments and accessible digital content that can be seamlessly shared around the globe. This will allow societies to evolve towards a genuine culture of lifelong learning – where learning effectiveness, economic productivity and personal fulfilment will converge.

As a learning society, Europe may be able to live up to the Lisbon objectives – even in a "flat" world – or, rather, an "open world."

The eLearning Industry group is an open consortium of leading ICT and eLearning content providers established with the support of Commissioner Reding to promote the development and deployment of e-Learning throughout Europe. The eLIG consists of 43 members represented in a core group and a consultation group.

The European eLearning Industry Group has launched in late 2005 an initiative "eLearning to support skills for employability in Europe".
Within the scope of this initiative eLIG will demonstrate best practices and showcases that can be potentially scaled up to address one of the most pressing economic and social issues in Europe. With new improved ways of addressing the dynamic skills needs of our fast changing economies on a large scale, a big step could be made towards the Lisbon Objectives.

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More info: www.elig.org