

Competing in a “Flat” World – Innovation and Openness for Lifelong Learning

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A Fast Changing Environment

Technology’s innovative and transformative powers have been a source of great expectations and challenges. Ever since Peter Drucker coined the term “knowledge worker” back in 1969¹, we have seen the surge of an increasingly globalized knowledge economy, fueled by information and communication technology. The fusion of technology and globalization has produced new ways to adapt, innovate and learn in a fast changing environment.

With reduced barriers to entry and innovative business models, millions of potential customers are now just a click away. Powerful networking technologies are also enabling new configurations of organizations across and between continents. As a result, the world has become “flat” – a notion popularized by Thomas Friedman². In this sense, global competitors must now cope with a more level playing field – which presents new opportunities and challenges. For example, Information and Communications Technologies (ICTs) are powering a massive and pervasive innovation cycle in all fields of our societies and economies. Consequently, stability and continuity are notions of the past – now it is all about adapting to change, transformation and discontinuities. The sheer pace of change and its potential for disruption is augmenting this challenge and making it unique in comparison to other innovation cycles.

In this globalized world, competition is intense and innovation is becoming the primary driver for growth. However, sustaining innovation needs to be enabled by an environment of cross-functional and cross-institutional collaboration, as well as continuous learning.

These new realities have significant implications for lifelong learning. For instance, multiple careers during the course of a lifetime will become the rule rather than the exception. This may include shifts in roles from the private sector to the public sector, from full-time to part-time work, from employment to entrepreneurship, from profit to non-profit organizations and from paid to volunteer work. With major demographic changes in Europe and the inevitable extension of active participation in the labor market, a multi-generational economy is emerging with an increasing share of an aging workforce in Western European countries.

In this environment, lifelong learning must become a distinct cultural value. A society that embraces lifelong learning is known as a “Learning Society.” It is characterized by: a high degree of adaptability; anticipation for changing skills and competency needs; inclusion of all parts of the population in the process; and an appreciation for a culture of learning and innovation. Its main constituents are knowledge workers, whose share in the total workforce has increased from a couple of percentage points at the beginning of the last century to more than 40 percent at the turn of the 21st century. The ambitious Lisbon targets set by the European Union – to make Europe the most competitive knowledge based society in the world, creating sustainable growth and jobs – implies

innovation in all fields, including skills and learning. Commissioners Reding and Figel made this clear in their concluding statement following the 2005 conference, “Towards a Learning Society.”³ They emphasized the need to transform education by leveraging ICT and thus, support for the Lisbon objectives for growth and jobs.

Innovation and Lifelong Learning

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 individualization. In a technology-enabled lifelong learning environment, digital literacy will be critical prerequisites 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”⁴.

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 Commission⁵, 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 job⁶. In this sense, ePortfolio⁷ 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 learning⁸.

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”⁹ – a more standardized 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)¹⁰ 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 ecosystem¹¹ 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 institutions, 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 education¹². 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.

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 spiraling costs, inadequate service levels, lack of specialized 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 centralization 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 architectures¹³.

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 standards¹⁴.

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 direction¹⁵.
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 adaptability 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 programs. Active labor 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 fulfillment 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.”

NOTES

1 in "Age of Discontinuity: *Guidelines to our changing Society*" (1969)

2 in "The World is Flat: *A brief History of the Twenty-first Century*" (2005)

3 Joint statements by Commissioners Reding and Figel, 19 May 2005

"eLearning is progressing from the basic use of ICT for Learning, to new forms of education and training and new skill requirements for the knowledge society. ICT technologies have the potential to significantly advance our progress towards the growth and jobs objectives of the revised Lisbon strategy, as new open and flexible forms of ICT supported learning (eLearning) are increasingly being used for the re-skilling of workers."

4 Mark Prensky, "Digital Natives, Digital Immigrants" from *On the Horizon*, NCB University Press, 2001

5 "*Lifelong learning*" means all general education, vocational education and training, non-formal education and informal learning undertaken throughout life, resulting in an improvement in knowledge, skills and competences within a personal, civic, social and/or employment-related perspective. It includes the provision of counselling and guidance services.

6 Education Development Center, Corporate Culture Study

7 ePortfolios in higher education have emerged as a valuable online tool that learners, faculty, and institutions can use to collect, store, update, and share information. They allow students to reflect their learning, communicate with instructors, document credentials, and provide potential employers with examples of their work. (EDUCAUSE). See also: [http:// www.europortfolio.org](http://www.europortfolio.org) ; <http://www.imsglobal.org>.

8 The European Commission holds that learning embraces all forms of learning be it *formal, non-formal or informal* and that all forms must be valued.

Non-formal learning: Learning which is embedded in planned activities not explicitly designated as learning (in terms of learning objectives, learning time or learning support), but which contain an important learning element. Non-formal learning is intentional from the learner's point of view. It typically does not lead to certification. (Cedefop, 2003)

Informal learning: Learning resulting from daily work-related, family or leisure activities. It is not organized or structured (in terms of objectives, time, or learning support). Informal learning is in most cases unintentional from the learner's perspective. It typically does not lead to certification (Cedefop, 2003)

9 In their 2004 report "Thwarted Innovation – what happened to e-learning and why", Robert Zemsky and William F. Massey point out that true learning innovation was still not happening on a broad basis. They dispel a number of Myths regarding the impact of e-Learning such as "build it and they will come" and demonstrate that a "dominant design" has not yet taken hold. The idea of a dominant design was developed by MIT's James Utterback, who showed that in early stages of innovation there is a lot of experimentation going on and the market is fluid. Eventually a center of gravity and a more standardized way of applying the technology emerges, that Utterback calls "dominant design". He has demonstrated this process in an impressive way for the car industry.

10 55-65% of organizations have some kind of Learning Management System (although many of these are in the process of being replaced). The Convergence of Learning and Performance Management: Has Talent Management Arrived?, Josh Bersin, September, 2005, © Bersin & Associates

11 An ecosystem is a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit. Humans are an integral part of ecosystems.

Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as regulation of floods, drought, land degradation, and disease; supporting services such as soil formation and nutrient cycling; and cultural services such as recreational, spiritual, religious and other nonmaterial benefits (education).

An **open ICT ecosystem** encompasses the policies, strategies, processes, information, technologies, applications and stakeholders that together make up a technology environment for a country, government or an enterprise. Most importantly, an ICT ecosystem includes people -- diverse individuals who create, buy, sell, regulate, manage and use technology. It allows for interoperability across "diverse architectures", is user-centric, collaborative, sustainable and flexible: <http://cyber.law.harvard.edu/epolicy/roadmap.pdf>
The Roadmap for Open ICT Ecosystems (with support of IBM and Oracle)

12 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 SW code.

13 To better understand the implications of a “service-oriented” architecture for learning, think of an architecture where monolithic learning applications are broken into collections of simpler functions, called services. A service is a function that is well-defined, self-contained, and independent of the context or state of other services. For example, “presence” is a collaboration service – it indicates whether a user is online or not. This service can be embedded in many applications – instant messaging, virtual classrooms, and even word processors.

In very simple terms, a services oriented architecture enables learning content to be easily accessed and leveraged. It allows any service or application to know who the user is (e.g. what role they have, what skills and expertise) as well as what the user is doing (e.g. what business process he is involved in and what step he is trying to execute). By taking advantage of this context, learning can be delivered to a particular user that is relevant to performing a specific task.

14 eLIG therefore recommends that deployment of an interoperable e-learning technology architecture based on open standards should be a critical element of an eLearning strategy. This needs to be reflected in the public procurement standards within the European Community and benchmarked accordingly.

15 Examples include the Kemnal Schools in the UK leading the way and national programs such as “Building the Schools for the Future”. France has established a country wide framework with “Espace Numerique de Travail”.