

learnovation



ICT and lifelong learning for a creative and innovative Europe

*Findings, reflections and proposals
from the Learnovation project*

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The Learnovation project (co-funded by the European Commission, DG Education and Culture, under the Lifelong Learning Programme KA4) is aimed at stimulating a consensus-based definition of e-learning and technology-enhanced learning, in order to encourage the use of these two forms of learning when implementing lifelong learning strategies across Europe.

Learnovation addresses the needs and problems of the existing e-learning vision in Europe by adopting an iterative, open and reflexive approach that will first prepare, then openly discuss, and finally target and disseminate a new articulated vision for European e-learning.

Learnovation analyses innovative paradigms and links them to relevant policy priorities through the e-Learning Territories filter in order to:

- Help to overcome functional problems relating to e-learning and its development;
- Contribute to illustrating how e-learning is following different evolutionary paths in different territories;
- Support networking, coordination and integration among sectoral, specialised and national observatories and projects;
- Promote more focused benchlearning by shifting from comparative national assessments towards a more reflective and adaptive analysis of differentiation factors;
- Contribute to the identification and collection of relevant indicators on e-learning development and the impact within each territory.

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Introduction: Creativity and Innovation in learning through ICT

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Over the past decade, ICT have enabled changes in the way people live, work, interact and acquire knowledge. Successful education and training in our knowledge society depend increasingly on the confident, competent and innovative use of ICT.

Progress in the use of ICT for education and training across Europe has been substantial over the past few years. ICT have been taken up largely in educational institutions. There is broad agreement that ICT are helping learning in schools, and that e-mature schools produce better results. Higher education is also reaping major benefits from ICT and steadily coming to grips with their potential for distance learning, virtual mobility and ongoing professional development. Large companies and public administrations report good results from e-learning in the workplace.

Despite this growing take-up, studies show that ICT have not yet had a transformative impact on teaching and learning in education and training institutions¹. While many educational institutions all over Europe are currently experimenting with diverse digital tools, the approaches developed are not always creative or innovative. This is important, as the impact of ICT use on students is highly dependent on teaching approaches, and better skills result from the use of student-centred guidance, group work and inquiry-based projects.

The effective integration of ICT in education and training must go beyond simply replacing, streamlining or accelerating current practices. It is also necessary to find new and more effective ways of operating, supporting pedagogical and organisational innovation. It is important to envision what learning in the knowledge-based society in Europe in 2020 will be like and what kinds of skills and competences need to be learned for the new jobs of the future.

Since the Lisbon Council in 2000 identified ICT as a core component of the knowledge society and a necessary instrument for adapting education and training systems to it, Europe has gained extensive experience in ICT for learning. The eLearning Initiative and Programme of the European Commission were adopted, with specific funding and the strong support of stakeholders. This led to extensive networking activities through Europe-wide projects; e-learning was put on the education agenda and an increasingly professional community has developed. Since 2007, ICT for learning have become one of the four cross-cutting lines of the Lifelong Learning Programme and a general priority in the four vertical programmes (Erasmus, Comenius, Leonardo da Vinci and Grundtvig). In this way, ICT use in education and training has been mainstreamed, representing an important step towards the integration of ICT in lifelong learning policies. The projects illustrate how the European Commission promotes ICT for learning, supports the steady progress in the use of ICT for education and training across Europe, and the role ICT play in enhancing creativity and innovation in learning.

The role of ICT in learning and teaching, in particular to enhance creativity and innovation among people and organisations, has also been highlighted in recent communications of the European Commission² such as *An updated strategic framework for European cooperation in education and training*, and *New Skills for New Jobs*. The *2009 European Year of Creativity and Innovation*³ focuses on the role of ICT in enhancing cross-cutting skills such as creativity and entrepreneurship, and

¹ European Commission Staff Working Document, 2008:
<http://ec.europa.eu/education/lifelong-learning-programme/doc/sec2629.pdf>
and work of IPTS (JRC) on ICT for Learning : <http://is.jrc.ec.europa.eu/pages/EAP/LearnCo.html>

² http://ec.europa.eu/education/lifelong-learning-policy/doc32_en.htm

³ <http://create2009.europa.eu/>

pushes forward innovation in education and training. The ICT cluster⁴, representing various Member States under the Education and Training 2010 programme, provides an open forum for debate and peer learning. The common conclusion is that ICT need to be seen as a key tool for the modernisation and improvement of all aspects of education and training. Planning for the introduction of ICT is not enough; what is needed is transformation.

This special issue of the eLearning Papers describes the main outcomes of the Learnovation project. Each paper will highlight one of the ICT, lifelong learning and innovation reports, analysing innovation paradigms within different formal and informal learning contexts. The main stakeholders have been closely involved in the ongoing research and policy work of the project through the Learnovation Roundtable. As such, the project has contributed to a better understanding of how to realise the potential of ICT applications to make learning more efficient, equitable and innovative and to identify critical issues for the next stage of using ICT in education and training and the associated need for accompanying pedagogical, organisational and technological innovation.

Over-expectation or under-exploitation?

Claudio Dondi

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For about ten years, eLearning has been a key part of the innovations characterising education and training systems throughout the world. After a phase of excessive enthusiasm and spectacularly excessive resistance, more reasonable expectations and attitudes have emerged, more attention is being paid to the issue of quality of the learning experience, and dissemination of e-learning best practices within educational systems is taking place, although not as quickly as originally expected.

Expectations are important in our lives, in the economic cycle and, of course, in the world of learning: the original expectations in relation to e-learning (of those who supported and promoted it) were that it would increase the efficiency of teaching practices in institutional education and the corporate training sector. This did partially happen, but not to the extent and in the way expected. Many policy-makers, teachers and learners questioned the quality of the e-learning experience achieved through first generation e-learning, attention was paid to the contextual and social dimensions of the learning process and, at the same time, social computing emerged as an interesting development for learning processes, especially those taking place on a more informal level.

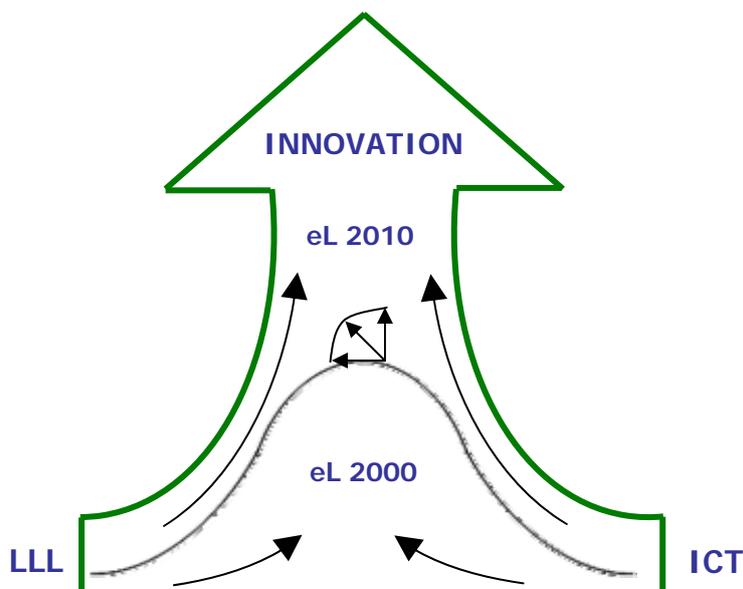
The dream of lifelong learning is becoming more realistic as the majority of the population becomes familiar with the concepts of searching for information, establishing peer groups and learning about what they are interested in online.

What does all this have to do with the original expectations of e-learning? It is both less than expected in the traditionally structured way of teaching and more than expected in the area of informal learning. So, one could say that, yes, people expected too much, but essentially there was an erroneous expectation that ICT for learning would have the greatest effect within the formal learning/teaching environments. When the radio was invented, one of the main expectations was that it would bring opera to the masses; it probably did, but radio applications in the field of information were far more important.

⁴ ICT cluster reports: <http://www.kslll.net/>

Similarly, by studying in detail what happens in the different territories of e-learning, one gets the impression that the full potential of ICT for learning embedded in change has yet to be exploited.

ICT for learning must rid itself of a low profile image due to immature experiences at the start of this decade. A new and more mature expectation of e-learning is emerging, linked to the implementation of the lifelong learning concept. It is particularly important to reflect on how learning together online in organisations, professional communities and educational institutions is a necessary strategy to accompany and sustain the processes of transformation and innovation, enabling the circulation of a huge amount of tacit knowledge that can be shared only within a trust-based and knowledge-sharing relationship, to a significant extent out of the formal praxis (educational as well as organisational).



This figure, which represents the key message of Learnovation, shows how most of the policies, initiatives and e-learning practices have applied ICT to the teaching world of formal education and are progressively achieving innovative results. However, the real underexploited potential of e-learning lies in its close association with all of the major innovation/transformation projects that governments, enterprises, public authorities, education and training institutions and, of course, individuals undertake. It is difficult to imagine that these innovation/transformation projects can succeed as a result of a commitment to learn and achieve change, and it is difficult to imagine learning among individuals, groups and organisations taking place in 2010 and beyond without the use of the technology, educational resources and social networks used by people in their everyday lives.

This issue by the Learnovation project is about expectations of e-learning (in the past and in the present) and exploitation of the e-learning potential (particularly in the future). It is proposed as a basis for broad stakeholder consultation on the future impact of e-learning on lifelong learning and innovation. We are very grateful to the European Commission and the EACEA for their support of the implementation of this project within the Lifelong Learning Programme, and to all the experts and practitioners who have helped the project team achieve its results to date.

Learning in the life of digital natives

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1 Introduction: educating and training digital natives

This article provides a cross-thematic analysis of the relationship between ICT, lifelong learning and innovation in the worlds of school education, vocational training and teacher training. These territories are analysed by looking from different perspectives at the dynamics of coexistence in these fields of so-called “digital natives” and “digital immigrants,” pointing out the relevant findings of the work carried out by Learnovation in these fields, as far as these quite different processes of “technology socialisation” are concerned.

The starting point is that, when it comes to learning, the level of digital nativeness is key. An individual gaining first learning experiences in a digital environment develops learning habits (including all decisions taken on learning) that are quite different from those of individuals familiar to learning in “analogue” environments. This dichotomy seems to have substantial value when analysing changes/innovative processes in learning, particularly in territories that are characterised by long and intensive periods of life, where learning (predominantly formal learning) plays a central or the central role in life.

The rapid and accelerating digital changes of the past few decades have led to changing first learning experiences, which have a significant impact on the school-age and young-adult cohorts of today and tomorrow. These learners characterise the learning territories constituting this cluster.

Based on this definition, different “tribes” of digital nativeness should be noted. We therefore propose an initial typology draft:

“Mother tongue” digital natives. These are characterised by the description, i.e. individuals who have gained basic experience in learning and learning tools/media in a “digital only” environment.

“Early educated” digital natives. This group has gained non-digital early experience in a rather informal setting. Subsequently, initial targeted learning experiences, triggered from the outside in an organised way, were gained in a digital environment. This might be the case, for example, when computers or computer games were used in pre-school environments, or when reporting to other children at nursery school took place with the help of a digital camera or a microphone, etc.

“School age” digital immigrants, “Secondary school” digital immigrants. This group was confronted with digital means in a later school process, which means that respective tools and basic skills had already been developed before in a non-digital environment. This late familiarisation with digital solutions requires a change in behaviour, as other pre-digital solutions remain analogue metaphors structuring digital behaviour.

“Adult” digital immigrants. This group is characterised by a change (complete or partial) from pre-digital to digital skills and media at an age where all relevant skills in learning are fully developed and automated in a non-digital form. Adult car drivers switching to a navigation system, for example, usually have experience with non-interactive printed maps only.

2 Features of the cluster

A number of key features seem important for this cluster, which may help to understand the commonalities among school education, VET and teacher training.

Measurable economic/GNP share

The territories constituting this cluster are those that are most transparent and statistically measured in terms of overall expenses, normally by a percentage of the GNP. We can easily benchmark different societies in relation to the share of GNP that they allocate to schools, vocational education and training and the underlying training of teachers and trainers.

Global (but young) benchmark tradition

Starting with the school sector, and closely linked to the training of teachers and trainers, this cluster has a common (but young) tradition of international benchmarks. Over the past decade, this has been carried out most visibly by the OECD, its most popular activity being the PISA benchmarking system. In this cluster, we can demonstrate the role benchmarking can play in the innovation process in learning. This can serve as a model for further development in this cluster as well as recommendations for the sustainable analysis of other clusters.

National/regional responsibility in the core of national/regional identities

Policies on the three territories making up this cluster normally play an important national or regional role because, over the past decade, education has become one of the core policy areas in most countries. In general, one can observe a certain highlighting of this policy area compared to the previous period, at least on the level of policy rhetoric. However, it is clear that this national or, in the case of many bigger European nations, regional responsibility (as is the case in Germany), as well as the educational policies and underlying values shape and contribute to national (or regional) identity to a certain extent.

3 State of the art - and the way leading to it

What was expected?

If we look at the transversal impact of ICT in terms of innovation and creativity in school education, VET and teacher training systems in Europe, expectations and hopes during the past decade seem to have taken two core directions:

Cheaper learning results and/or broadening access to learning in general

Based on an “industrial” logic, this concept assumed that economy of scale could be introduced into traditional learning institutions by technologies. This approach would make it possible to achieve the same goals with constant quality and substantially lower resources and reduced costs. The concept could be used either to reduce public spending or (and this method is predominant) to increase participation in learning, e.g. increasing the percentage of students completing post-secondary school education, increasing the number of young people successfully qualifying in VET, or increasing the percentage of people in a cohort with a higher education degree, among others.

Structural changes, more learner-centred/more constructivist learning

Structural improvement beliefs focused mainly on the idea of speeding up and mainstreaming the process of a switch from teaching/teacher-orientation towards learning/learner-orientation on a coherent basis by increasing the level of individualisation. It was assumed that this would be achieved by granting the learner more control over aspects of the learning framework (place, pace, motivation, approaches, content priorities, etc.). Sometimes both hopes were been incorporated into a single policy agenda, resulting in terms such as “better/longer learning for everybody.” Learning innovation was often seen as a way out of the trap of increasing learning needs and restricted budgets. By creating a fashionable novelty, the aim was that technology would be used as a lever to push forward structural innovation in educational systems or subsystems such as teacher and trainer instruction in a bottom-up way, i.e. driven by a general fascination with technology among young learners.

What happened?

When confronted with reality, some beliefs, which guided the expectations presented above, looked overambitious or too naive, as a result of simplified assumptions on context development, processes and mechanisms in societal change. A short explanation follows:

Beliefs in a shortcut from consensus to success

At the beginning of the e-learning action plan, there was an implicit strong belief that consensus processes (when carefully carried out, including all actors on an European level and led by the power of synchronisation of these actors’ aims and goals) would automatically lead to respective actions, suitable for achieving these goals. This assumption failed, however, as it underestimated the policy rhetoric share within these processes, as well as its potential to activate all types of resistance and counter-directed interests. Mostly driven by hidden emotions and preoccupations, these interests alert and synchronise conservative forces that grow out of a fear of losing influence within substantial change processes.

Beliefs in indicator-led consensus and policy definition

This belief is linked to the way in which the Lisbon goals were originally defined with a rather simplistic model of interdependencies. This was based on the assumption that, if all citizens learn throughout their lives, the European Union will become (almost automatically) the most competitive and most inclusive society worldwide. These approaches, based on a certain historical amount of shared enthusiasm, turned out to be too simplistic to work, particularly because they confused possible mainstream solutions with procedures that had proven their functioning on a pilot level only and under certain, not mainstream, context conditions.

Beliefs in global benchmarks

The period was characterised by serious approaches to introduce benchmarking instruments, which obviously work well in the global economic field (in the short term, as well as in the long term), into the field of educational institutions. It was no coincidence that the OECD, with its experience in the benchmarking of economic indicators, was the first institution transferring those models into the education sphere through its benchmarks (e.g. for teacher indicators and teacher and trainer training) and the PISA studies for key competences achieved at secondary school. Obviously, those comparative global benchmarks developed a high potential to alert the public and thus triggered intensive societal discussions on education and its role in society, including the national position in the international context.

Nevertheless, to a certain extent they failed to prepare decisions in a systematic and comparative manner and to use effective processes to base innovation in education on the proper, professional analytical use of benchmarking results. One of the many reasons for this was the lack of awareness about the need to move in a methodologically ordered and organised way from the benchmarking phase to a subsequent phase of collective bench-learning, i.e. a procedure on how to derive context-adequate tailored strategies for improvement from benchmarking positioning in a stakeholder consensus process.

Beliefs in “buyable” policy aims and policy success

Over the past decade, some strategies from the economic sector were directly transferred into the educational field, including the assumption that money and allocation of funds are the most successful and suitable policy tools to achieve goals. Unfortunately, there is evidence of a negative correlation for such assumption, specifying that, when an announced budget increase for education does not take place, it is very likely that an agenda of substantial educational change will not succeed. This observation somewhat illogically converted into the belief that innovation in the desired direction would happen almost automatically on the condition that sufficient budgets were allocated and spent properly to achieve it. This assumption has limited success because, consequently, all non-monetary policy measures necessary or suitable for successful innovation would no longer be needed for proper educational policies. These include awareness-raising, changes in attitude in society, different levels and considerations in relation to life priorities, etc.

Complete underestimation of institutional and structural inertia and its self-organisation and stabilisation potential

Based on the dominating beliefs in consensus building, the contrasting processes of institutional inertia were completely underestimated in terms of their impact, as the forces and mechanisms to keep this inertia high (to avoid a weakening of the respective institutional “establishment” and instead reinforce the inertia “wall”) were not fully understood. Initial approaches to address these dynamics of inertia in a methodologically consistent way and to manage its change in parallel with the support of innovation began only some years ago in the educational field and are still not widely accepted as a necessary support strand of policies on educational and learning innovation.

Short-term success expectations

The perspective for successful changes in educational policy was being linked to the periodicity of election-led policy-makers on a regional, national and European level. This led to short-term success expectations of, say three, four and five years to achieve substantial changes in educational institutions. The perspective completely underestimated the strong interdependencies with other subsystems of society, in which a certain rigidity necessarily has the function of stabilising the processes of societal change. Using the metaphor of a semisolid fluid, trying to increase the speed to pass through over proportionally increases viscosity, resistance and, thus, the energy needed to pass through.

Underestimation of resources necessary for sustainable system change in educational institutions

Almost all non-financial resources to effect sustainable changes were underestimated in terms of amount. In addition to money, time, pre-requisites for changing other elements or functional processes in education, patience with the slow societal processes of attitude adjustment, etc. are necessary.

Future needs

Based on the considerations and analytical approaches in relation to what happened in the past, assessing the meaning of these findings for future needs is quite easy and straightforward. Several categories can be described as follows:

More complex metaphors and process models

As a result of the experiences of the past decade, we see a clear need for dialogue amongst professionals on appropriate, hence more complex, metaphors and process models, which include the societal, economic, cultural and historic elements of the context and processes in education.

More patience

One of the messages seems to be that the election period cycles of policy goals guide us to excessively short-term perspectives that are insufficient for sustainable measures and therefore sustainable changes in the field of education. This demands more patience through mechanisms that allow more coherence in educational policy and serious changes in policies following elections. How this can be achieved can be seen partially in areas such as infrastructure policies or long-term areas of economic policies. These mechanisms evidently overcome the segmentation into election periods and may also be used in educational policies. To a certain extent, mid-term overall policy goal-setting, such as the Lisbon and Copenhagen processes, needs to be translated more coherently into national and regional educational policies respectively, including clear consensual policy targets derived from them. How and to what extent they will be achieved must be measurable against socially relevant indicators defined from the outset.

Respecting the deep societal and societal value consensus embedding of education

As pointed out earlier, education is deeply embedded in societal values. Each innovation therefore has to respect the existing values and beliefs on education as a constituent element of national, regional and sometimes even local identity. Respecting the context for educational innovation, national and regional society stakeholders need to be more included in a broad and prospective open dialogue, i.e. a dialogue that takes place earlier, is broader and addresses public awareness through the media sufficiently in advance.

More professional processes to generate sustainable and favourable conditions for change

The awareness of a need for professional processes and professional management of these processes in large-scale societal change is just emerging, having been initiated on the level of the European Union as a result of critical discussion on the insufficient intermediate results of the Lisbon process and several underestimated processes within the extension of the community. The present situation therefore seems to be promising in terms of demanding a higher level of professional management of favourable conditions in educational innovation for the next decade.

A better toolbox for innovation management and systemic support for societal learning processes

To achieve that big step forward towards more professional management it is necessary to install and develop an adequate toolbox. Many of these tools already exist, but are on too small a scale, too restricted to particular subfields in the educational sphere, or successful in other areas but their transferability to the educational world has not yet been tested. A cooperative, broad process to gradually increase and assess these tools is therefore an urgent need, in order to build up and enrich such a toolbox.

Present challenges

Through the commonalities among the territories, the core challenges become visible as a result of the analytical comparison. For an initial round of discussion, the following are given without comprehensive explanations as bullet points:

- Broadening participation in learning in a socially inclusive way (“nobody left behind”)
- Regaining life relevance for educational institutions in schooling and VET, including more life-relevant competencies for teachers and trainers, particularly in the educational field beyond domain knowledge (relevant key qualifications), strengthening permanent innovation and competence orientation in teacher and trainer lifelong learning.
- Better synchronising non-formal and informal learning with formal learning led by educational institutions.
- Supporting early education using the powerful e-motivation of “advanced digital natives”.
- Bringing schools and VET from a selection logic to an empowerment and capacity-building logic for all.
- Helping true learner orientation (beyond mere rhetoric) to become mainstream reality.
- Marrying innovation in learning with intensified value education.

4 Conclusions and recommendations

Following a detailed situation analysis, we now try to use the model of different “digital natives tribes” and the dynamics of the development of “digital nativeness” to gain a more systematic view of one of the core dynamic factors for institutional educational processes in schools, VET, and (depending on this) the territory of training of teachers and trainers.

From selective top-down (as a long-standing educational institution/policy tradition) to general bottom-up learner-driven initiatives

Policies and the development of our educational institutions are traditionally based on the assumption that society at large and its representatives are better prepared than their clients, i.e. learners, to design and implement educational institutions and to change these institutions to maximise benefits for the individuals as well as for society in general. Such a model of a competence-hierarchies-governed democracy is contrasted by the increasing potential of individual decisions and bottom-up consensus and/or co-acting processes open to all citizens. Those processes are obviously facilitated and speeded up (among other factors) by technological innovation.

The evidence of user-oriented social software, used within the frame we call “Web 2.0”, particularly demonstrates the dynamic unleashed by these processes. If we compare statistical data on indicators for the take-off of technology-triggered innovation in schools, VET, and teacher training over the past 10 or 20 years (with its rather slow progress diffusion speed of typical Web 2.0 applications such as Amazon, eBay, Google, Wikipedia, Facebook, YouTube and many others), we gain an impression of the quite different range of dynamics. Therefore, that shift from top-down triggered innovation to bottom-up supported/demanded/prepared innovation seems to be one of the key elements of the transition from the past decade to the coming one.

General joy-led digital behaviour “swapping” over to educational institutions

If the assumption above were to be proven, it would be useful to develop a hypothesis on how the “digital native tribes” will demand innovation in educational institutions in a particular way. What we can state in general is that joy-led behaviour, which is based on individual decisions among other alternatives, is more attractive by definition for the target groups of educational institutions than prescribed, homogeneous activities. If we look at the high dynamics of Web 2.0 applications, for example, and the similarly high dynamics of complex mobile phones, developing quickly into multifunctional smart phones with ambient potential (like the quick replacement of traditional geographic thinking and use of maps and signs by location services-based navigation), we can estimate the power of these “swapping” processes.

How to identify and predict the “digital native potential” for educational innovation

In order to identify and predict developments, we would need to know more about the digital life history of an individual learner, as well as of groups of learners or cohorts. At this moment, we can only make raw assumptions based on actual behaviour. However, we normally cannot distinguish whether this behaviour is based on a familiarity from the beginning or on a change process of the original habits of use. Therefore, a more narrative, life-history approach in identifying the individual experiences and tool use of our learners seems to be a core prerequisite. Based on this and a verified typology of different digital native tribes, we are able to predict the future composition of aims, preferences and competences earlier and with more precision.

How to use the “digital native potentials” to drive educational innovation including structural, institutional innovation and the “learning culture”

The easiest way to use the motivational and competence potential of learners is to allow the individual to choose from among different alternatives of behaviour, not only identifying personal preferences but also testing those preferences against their use in reality. Comparing different options in a sound self-awareness process and diagnosing personal competences and wishes, learners in an interactive process come up with preferred behaviours. These “rich choice situations” and the provision of reliable, valid feedback provide the best basis for fostering educational innovation through bottom-up processes from single learners. It is, of course, not trivial to introduce, create and cultivate a climate and culture of learner choices in institutional environments, in which prescription of behaviour has such a long and strong tradition. Nevertheless, the priority of approaches to change these traditions and habits seems to be to facilitate innovation.

How to use productively asynchronous “digital native potentials” and learner heterogeneities at large

First, it is necessary to identify, understand and assess the level and nature of heterogeneities to be found among individual learners, groups of learners or populations of learners. It is necessary to detect which elements of this heterogeneity under which conditions can lead to a fruitful exchange of knowledge, attitudes

and values among peers, in order to broaden the perspective and therefore the opportunities for each individual. Secondly it is necessary to ask to what extent such heterogeneity is complicating, avoiding or blocking the necessary flow of communication and exchange of experiences and opinions. Again, this balance/optimisation is not a trivial process. Identifying and reacting appropriately to the amount of heterogeneity in groups of learners, focusing on the individual differences rather than on the homogeneities, is an important element of systemic innovation in these three territories.

How to take advantage of the “digital native potential” for application to policy top-down decision processes

Usually, decision-makers and learners in school, VET and teacher training have quite a different “digital native status” compared to educational beneficiaries. Taking as an example decision-makers in the three territories over the past decade, we can see from the outset a dominance of policy-makers who had been “analogue natives.” This experience of partially immigrating into the digital universe only in later life characterised decisions, whereby digital means were mostly seen as a more effective, cheaper or more flexible means for realising traditional metaphors (such as virtual classrooms, online courses, web tutorials, etc.). This gap was bridged partly by those “analogue natives” who had the opportunity to gain access through family relations (in a process of “backwards-heritage”) from their daughters, sons or nephews respectively, in order to become “semi-digital natives.” Our current situation is characterised by a generation change of policy-makers, where more and more decision-makers are joining the game, and they might be classified in our scheme as “mainframe natives” or even “Amiga/Pacman-semi-natives.” They have more genuine digital experiences or at least part of those genuine experiences. Therefore, the gap between them and current ten- to fifteen-year-old natives is decreasing.

These considerations have two consequences: firstly, policy-makers should be encouraged to be more attentive to the younger generations (particularly in relation to the media culture), observing them, asking them questions and learning about their perspective on digital potentials. Secondly, an attempt should be made to attract more young policy-makers to the field of education policy in order to gain their viewpoint, at least partially, using the potential of “digital nativeness heterogeneity” as an analogy in the process of educational policy-making.

e-Learning, Lifelong Learning and Innovation in the working world

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1 Introduction

While in the year 2000 e-learning was perceived as a single mega-trend for education systems and the corporate world, experience has shown that the purpose, pedagogical models (or rather learning heritage), organisation and economic assumption of e-learning were extremely diverse, not only according to the learning sub-system (school, higher education, vocational training, corporate professional development and adult learning), but also according to the visions of the world that those in charge of promoting and designing e-learning systems had in mind.

Such diversity in what HELIOS calls “e-learning territories” (HELIOS 2006) has resulted in a perceived loss of meaning of the term, too broad to represent realities that have very little in common, except the use of technology.

This article provides an in-depth analysis of the relationship between e-learning, lifelong learning and innovation in the working world, as a result of the comparative analysis of three e-learning territories, which are developing within and around the world of work and combining features of formal, non-formal and informal learning, i.e.: inter-organisational learning, e-learning in the workplace and professional learning networks. A short description of these territories is provided below:

1. **e-learning in the workplace:** use of ICT for learning in the corporate sector and public administration/agencies. Differences in the scope and delivery schemes of e-learning between the public and corporate sector prevail mainly due to the organisation structures and practices and the related human resource policies. In general, e-learning may take the form of structured training programmes fully online or blended schemes (complemented with seminar/classroom-based training), e-learning chunks on demand/on the job. The driving concerns related to most of these e-learning offers are the return on investment (emerging also in the public sector), the increased access and flexibility in training delivery, and the contribution of e-learning to achieving organisational change and fostering knowledge management practices. In this territory, the slow emergence of communities of practice approaches can also be observed in the most sophisticated organisations.
2. **Inter-organisational development through e-learning:** inter-organisational development can be described as a cooperative relationship between organisations that does not rely on the market or hierarchical mechanism of control, but is instead negotiated in an ongoing communicative process. Cooperation between organisations has come into focus in recent years with the recognition that success in a global economy comes from innovation and sharing ideas. The more change there is in its environment, the more connections an organisation needs with the outside world. e-learning, given the networking possibilities that it enables, is increasingly used for the purpose of inter-organisational development.
3. **Professional learning networks:** a professionally oriented virtual community is geared towards professionals and/or facilitates dialogue on professional issues. Professionals participate in these types of community in order to network with peers and exchange/share/build information and knowledge. In these communities, learning is intentionally enhanced in order to achieve professional development goals (although non-professionally related learning may be a side effect).

2 Changing relationships between working and learning

As seen from the Learnovation Cluster report, “Changing Relationships between Learning and Working” (Learnovation Consortium 2008), the relationship between working, learning and innovation in the territories analysed can be dealt with in two complementary ways, i.e.:

- The innovation required for the successful introduction of e-learning;
- The innovation that e-learning helps to develop in working processes.

In relation to the first point, several authors underline the fact that, whatever the e-learning territory, the more the introduction of e-learning is accompanied by an e-learning strategy supported by the management and the entire organisation/network, the more beneficial and relevant it can be to organisational needs. In this respect, a widely accepted change management model is that known as ADKAR (Laura Overton 2004). This is based on a five-stage process: awareness, desire, knowledge, ability and reinforcement. The figure below illustrates how this model works.

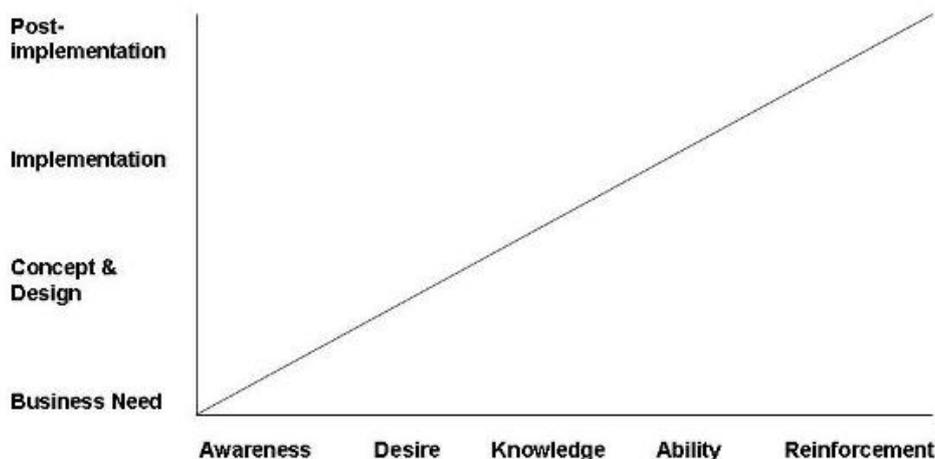


Figure 1: The Adkar Model

The awareness stage determines the need for change and the desire stage focuses on generating a desire to participate and support the change. Knowledge is concerned with determining how to change, which results in the ability to implement the requirements of such change, be these new skills and behaviours or procedures and processes. The reinforcement phase is critical to sustaining the change post-implementation and, in e-learning terms, would relate to the provision of support and personal satisfaction, for instance.

In a perpetual state of transformation, the enterprise is constantly reviewing and analysing its business needs to ensure that it is always aware of any need for change. The assumption of this model is that a change management strategy (involving e-learning or not) can be more effective if all of these steps are followed.

Other authors have devoted more attention to the specific issue of introducing e-learning into organisations and fostering networks or inter-organisational relations.

According to the guide entitled “Leadership and management of e-learning projects”, developed in the framework of the eTTnet project, “*By far the biggest requirement is ongoing support from management.*” (eTTnet 2003) Other authors suggest that (although crucial) this is only the first step.

For instance, Pam Pervenanze (2008) illustrates an approach for the successful incorporation of e-learning into the organisational/inter-organisational strategy, based on the following steps:

- *“Link e-learning goals with business goals;*
- *Ensure support from top management;*
- *Work with your IT Department to develop an understanding of your baseline technologies;*
- *Work with your IT Department to establish standards for working together;*
- *Create a plan to help your training department handle the change;*
- *Determine e-learning specifications;*
- *Determine how you will measure the results;*
- *Prepare a rollout plan”.*

But developing a shared strategy on e-learning requires, as underlined by a Headlines PR report (2003), many intertwined change management actions. These could relate, for instance, to:

- *“Marketing: A major part of the implementation plan should accommodate a detailed marketing strategy. This strategy should not differ from the overall company culture and business marketing initiatives.*

Employees should “feel” the effort made by management to embrace them as valuable contributors to the bottom line.

- *Training: Teaching new skills is critical to keeping employees motivated and productive and, ideally, companies must be introduced to a learning mechanism that allows learners to study in a way best suited to their needs, whether that is facilitated by a mentor or self-paced.*
- *Return on investment: This is just one very important component to consider when determining the success of a learning programme.*
- *Culture of the organisation: For e-learning to have a chance for long-term success, companies need to look at their employees’ current learning culture. In other words, can learners pace themselves or do they need tutors? They also need to look at how training was done in the past - was it instructor-led or self-paced training? Based on this, companies can address the process of how, in a new learning environment, workers and customers will learn, and must define how the organisation will invite, instruct, assess, stimulate, certify and enhance the performance of workers through this new learning process.”*

When it comes to the issue of the innovation that e-learning helps to achieve, there is not quite as much literature available. This is explained by Leslie Mackenzie-Robb, who argues that, “*In reality, e-learning projects seek and get no more than a top level sanction (mainly because of the budgets involved), and are not seen by senior management as tools for enterprise change. They are seen as tools for enterprise cost-cutting and pragmatism.*” (Mackenzie Robb 2004)

This is due to the fact that companies associate innovation with products, services and processes, but not often with learning. **Rather than being used to shape innovation, e-learning is used to accompany and, more frequently, follow it.**

However, the participants in the Helios survey (2006) on e-learning and organisational change seemed to be much more open about the innovation that e-learning can foster or contribute to fostering.

Over 80% of the respondents taking part in the survey agreed that e-learning changes the way training and learning is organised. Around 60% of the respondents agreed that the introduction of e-learning also has an impact on changing the vision or strategy of organisations, the organisational culture, the way in which the organisation operates and social relations within the organisation. On the other hand, only around one-third of respondents agreed that e-learning could actually affect the way in which the organisation is structured.

Public policies as well as public and private initiatives and pilot initiatives supporting innovation in this field have to tackle three kinds of frustration in relation to unrealistic/naïve expectations:

The frustration of large companies: convergence between e-learning and knowledge management did not take place: e-learning has become common practice in large organisations, but has not matched the knowledge management challenge. It has not gone into the area of tacit knowledge, but has simply been associated with explicit and “packaged” knowledge. e-learning is used to do what was done in the classroom for less money, but it is not used for innovation or change management. The connection between learning and innovation is missing.

The frustration of SMEs: e-learning was regarded, especially in the early days, as the solution to all SME training problems. The building up of social capital among SMEs and their service providers is a challenge that was frequently lost in past years. Increased competition, often reduced public funding, over-managed and under-led public initiatives: all these factors partially explain some of the failures, but the basic cultural problem that was not properly addressed when formulating the expectations was the lack of collaborative attitudes within SMEs when an immaterial and badly managed phenomenon such as learning is concerned. It is likely that there was no sense of urgency to learn together and/or there was not sufficient stimulation on the part of most of the initiatives. The proposed e-learning supply may have offered cost-effective solutions to ordinary problems but often did not match the emotional side of the motivation to invest in learning. It was probably not sufficiently associated to what SME leaders considered really valuable for their development or critical to their survival. This area of e-learning has not been studied in depth, so it is difficult to determine whether awareness of the problems is widespread and whether other diagnostic approaches and conclusions are available.

The frustration of professional networks: individuals do not always learn and share their experiences in innovative ways through e-learning. Moreover, collaborative learning is not growing as quickly as expected. Some experiences exist but are reserved for high-profile professionals, whereas relatively flat e-learning models are predominant, distributing the knowledge of more experienced and research-oriented professionals to other members of the professional community.

Other issues to be taken into consideration and dealt with are:

- Institutional hierarchies matter greatly in the diffusion and introduction of innovation in companies.
- Age and gender are also very important. A diversity management issue is also emerging. Recognising the value of difference must be seen as a way of fostering innovation and HRD.
- The role of trainers and learning facilitators must be considered: in this cluster, trainers have evolved faster than in formal education, from a role of transmission to a supporting role. It is more natural for them to adapt to change, since they are often employees of the company, borrowed for use as trainers.
- “Camouflage innovation”: a lot depends on how innovation is labelled. There are several “hidden innovation rivers”, not led by the organisation hierarchy, that produce conditions for future change and already practice innovative working and learning processes. One example is the increasing use of social networking platforms by employees during working hours: is this a real danger for the productivity of the workforce or could it be used as a learning resource with the adoption of new and innovative organisational and learning strategies?

3 Recommendations

In order to tackle the aforementioned frustrations, a number of actions can be suggested:

- Convey the message that participating in e-learning can provide leverage for organisational change and innovation in companies, since companies associate innovation with products, services and processes, but not often with learning or e-learning.
- Consider the specificities of public administrations (PAs). The lazy adoption of e-learning in PAs (more often than not introduced with a top-down approach and resulting mainly in IT or procedure-related courses) is an issue, as well as the very low motivation on the part of the learners and poor investment choices on the part of the PAs. The introduction of e-learning in the public sector should be associated with a reward system for improved performance.
- Recognising the value of prior learning in companies is fundamental and should be further promoted with a European dimension.
- The ageing society is an important factor to be considered when estimating the extent to which ICT can support learning and innovation within and among organisations.
- Training of trainers and learning facilitators should also be promoted in relation to their activity as peer mentors in professional networks, or as catalysts of inter-organisational relations, and their training experiences should be valued.
- Bottom-up innovation should be closely monitored to enhance its positive impact and the challenges that it implies should be anticipated/faced. For instance, the issue of how and to what extent social networking can be exploited for learning purposes within the working context should be investigated to transform a potential organisational danger (in terms of productivity) into a key learning asset.

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New Horizons for Higher Education through e-learning

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EDEN

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1 Introduction

The past decade in the field of higher education has been marked by initiatives of historical significance. These strategic endeavours were the Bologna process on higher education, the Lisbon strategy of the European Union and the related eEurope, e-learning and lifelong learning initiatives and programmes.

Over the past few years, the world of higher education has been the subject of intensive challenges. In an accelerated, globalised environment, the pressure to perform placed on institutions and graduates by employers and the corporate sector has increased. This pressure has resulted in an increase in efficiency, restructuring and innovation, but it has also contributed to strengthening flexibility.

There is increasingly intensive competition in the professional and social space, which is now occupied by higher education, both from the corporate education and training side and from the side of other educational sectors. The internationalisation element has also strengthened and reinforced global competition among universities.

According to Curran, e-learning strategies adopted by universities have been approaching the core issue from the perspective of three common objectives:

- Widening access to educational opportunity;
- Enhancing the quality of learning;
- Reducing the cost of higher education.

Evolved distance education is an increasingly common term used in the sense of traditional, professional, well-established distance education settings, such as open universities, which have been evolving continuously by integrating new approaches supported by ICTs. Whilst open and distance universities put the main emphasis on the learning organisation and instructional design approach, with the increasing performance, availability and affordability of ICT-based tools, the way in which they function has been changing considerably through the integration of e-learning elements.

As far as the innovation aspect is concerned, distance learning has always been characterised by creativity on the part of the educators and administrators who provide distance study programmes, characterised by access, choice and flexibility options for students.

2 State of the art - and the way leading to It

What was expected?

Since the mid-nineties, there has been a sort of ongoing enthusiasm concerning the potential and impact of ICTs in learning. The arguments were related to efficiency, cost-effectiveness and access issues with the traditional ICT-supported training approach. Later on, the model of learning in networked systems became a cutting edge concept.

It is worth recalling the approach of the EU Minerva programme in the late nineties, which recommended the “critical and responsible use of technologies” regarding the use of new ICT tools in distance learning.

ICTs have formed part of the expectations regarding the large-scale transformation of higher education, which was expected to become more inclusive, international and flexible. Less emphasis was put on innovation; however, the change in learning systems was part of the accompanying conceptual and strategic expectations.

Techno-positivism has also been present in the field of evolved distance learning, but has been counterbalanced by solid methodology and pedagogical traditions: instructional design, distance and open learning solutions have been proving their relevance in a well-established institutional and organisational environment. The access issue was a strong argument, along with expectation regarding the impact of information technologies.

The progressive vision of “mega-universities” (John Daniel) has formed part of leading concepts in the field, shifting the focus of interest to the extension of the distance learning and institutional e-learning system, as well as to the new approach to the more efficient use of methods and toolkits.

Highlighting lessons learned in the context of large-scale programmes in institutions, progress in terms of establishing a public reputation and academic credibility in distance education has been an important element. The concept was also intended to communicate the fact that such large-scale international institutions could help to recognise that distance education was widely acknowledged and accepted as an effective delivery tool in most countries.

In attempting to create a cost-effective means of delivering knowledge in line with the mega-university concept, economies of scale and other industrial models for producing education have been applied, whilst also acknowledging the fact that lifelong learners require specific instruction that meets their needs. The principles of product leadership, customer intimacy and operational excellence, as well as learner support, have been important in the development of new distance education endeavours.

Particularly in the e-hype period, there were significant expectations about e-learning and its potential to support virtual mobility, with the hope that it would form part of the greater transformation of higher education, becoming more inclusive, more international and more flexible.

The following innovation paradigms in virtual mobility can be identified:

- Mobility of identities in a new space called virtual space or cyberspace
- The process of virtual cooperation of learning providers
- The mobility of learners or learning facilitators
- The mobility of learning devices such as “learning that follows you” or mobile learning (which is not, however, associated with virtual mobility in mainstream research)

The EU e-learning programme helped to structure and conceptualise the broad spectrum of different efforts and schemes. The lifelong learning strategy and programme confirmed the approach of support for open and flexible learning solutions, including technology-supported learning. The overarching Lisbon strategy supplemented this by creating and maintaining an atmosphere of progress and modernisation.

Improving and implementing pedagogical approaches that support self-organised learning and utilise the potential provided by information and communication technologies and e-learning in lifelong learning are seen as concrete means of contributing to the Lisbon strategy.

ICT-supported learning was welcomed by higher education institutions as a strong modernisation message. Education policy-makers liked it because of the progressive perspectives and assumed transformation potential. In the public sphere, huge investment programmes were needed and implemented for equipment and networking infrastructure developments.

With access and quality as keywords relating to the international urgency for serious “university renewal” in the context of booming cross-border education expectations, new willingness among education providers was required to redefine models for delivering knowledge. Political attitudes towards higher education have put pressure on government and regulatory groups to promote policies for lifelong learning while cutting costs and increasing availability.

In the hierarchical, somewhat conservative, elitist atmosphere of universities, the increasingly better positioning of lifelong learning and technology-supported (mostly atypical) teaching solutions, along with the gradual acknowledgement of distance education, has brought open learning, distance learning and e-learning out of the ghetto. The incorporation of e-learning concepts into institutional strategies and increasingly national policies has also confirmed the move into the mainstream.

In support of the modernisation of education, large-scale public investments in computer technology and networking infrastructure were made at practically all of the institutional levels, but probably most intensively in higher education. In the meantime, the development of pedagogy and methodology and course development issues lagged behind considerably.

The emergence of lifelong learning has ensured a natural supportive environment for the field of evolved distance learning. The massive public investments in IT equipment and networking infrastructure in the education and training sector have supported the establishment of a technology background. Partly spontaneous, partly organised, the supported development of digital literacy and skills (among potential users and teachers) contributed to the dissemination and expansion of sophisticated solutions.

What happened?

With easier and cheaper access to higher performance ICT tools and networks, we can observe a proliferation of creative (initially experimental or pilot, but later integrated) ICT solutions. The high performance solutions on the market became more and more affordable, the technical performance of tools dramatically improved and the spectrum of solutions widened. There has been a relatively slow but huge penetration of different technology tools and solutions in learning and teaching practice. As a rule, this has come from the students, the users, and has been initiated to a lesser extent by the teachers or the institutions.

The ever stronger diffusion of increasingly sophisticated ICT solutions is changing the governing praxis and, slowly, the institutional structures. A sort of spontaneous penetration of ICTs in the learning domain has been accelerating beyond expectations. The non-institutional progression and adaptation pathways, as well as individual and informal actions, have played an important role.

One decade ago, it was stated that it would be more accurate to regard the growth of e-learning as a process of evolution rather than as a revolution. Nowadays, it seems that expectations about the revolution were somewhat exaggerated, linked to ambitious early e-learning visions. It was also expected that, with the development of e-learning, most higher education institutions would develop and implement a strategy for its use. This expectation probably still sounds too ambitious.

Nevertheless, recent analyses and system critics acknowledge that, at undergraduate level, ICT-supported solutions are largely supplementary to classroom teaching. ICT is primarily used to support existing teaching structures and traditional ways of tuition.

The roll out process may currently be observed: moving on from small-scale use by early adopters, more universities implement projects that roll out e-learning across the entire university population and courses.

The incorporation of the e-learning 2.0 approach into mainstream education did not progress as intensively as initially expected. Meanwhile, in the informal learning field, the collaborative behaviour of learners and the related tools developed. Positive progress was observed in the quality and accreditation of e-learning in higher education.

With the IT transformation-driven change of the traditional research structures, new collaboration and networking concepts and approaches emerged. New technology and methodology paradigms have transformed the scenario of learning solutions (social web, exploratory learning), accompanied by learning games and infotainment.

While many universities see lifelong learning as an emerging priority, there is little evidence that strategic actions have been taken to consider their missions or to anticipate the challenges ahead. Questions arise regarding the recognition of prior learning, which needs to be addressed. The implementation of Bologna reforms seems to have taken priority over developing lifelong learning strategies.

In relation to access, while almost all institutions consider increasing participation to be important, their expectations in terms of being able to contribute to this development are rather low. This demonstrates the importance of government policy in this area and the need for incentives, all the more so given the obligation felt by many institutions to improve competitiveness by attracting the best students; they sometimes falsely believe that this precludes improving the diversity of the student base.

Evolved distance learning, particularly from the perspective of open and distance universities, has maintained its position and most of its prestige. The response to the modernisation demand and digital challenge differed depending on the country. In the meantime, one can recognise the emergence of the generation of ICT-based development programmes in all institutions, which have a clear impact on the organisational and institutional strategies.

It is acknowledged that user habits and distance learner profiles are changing significantly, with high expectations for engagement. Many of the e-learning 2.0 trends are closely related to the change in user habits in ICT. The Internet as the platform, or the multi-device oriented system, changes the concept of studying in any place and at any time. However, these tools in many cases are only used as repositories of educational examples, resources, videos, links, or files.

Whilst the increasing dominance of e-learning in distance education (DE) and a certain convergence phenomenon can be observed, the use of ICTs as a learning resource and communication tool has not quite been distinguished from e-learning. Meanwhile, the traditional paper-based DE has almost disappeared, and mainly electronic (evolved) DE can be observed.

This has occurred in two ways:

- a) Digital delivery of “printed” material
- b) Re-engineering of the former curricula and material to offer online interactive resources with a variety of support, communication and face-to-face opportunities.

In higher education, institutional structures still tend not to allow managers and university directors to invest serious money and human resources in developments needed to achieve interactive self-paced material. Therefore, e-learning is often built into the tuition process, according to academic traditions. In the meantime, knowledge centre networking has been weaker than expected, and the expected virtualisation of universities did not really develop either.

Regarding virtual mobility, there is no real elaborated policy in this domain - the only exceptions are the achievements of some EU projects. The aim of equality in terms of access to international higher education has practically been forgotten. Only a few universities are really committed to virtual mobility in a longer-term perspective. Student associations are not opposed to the idea, but are not particularly supportive of it either.

Problematic parts and weak points in related policies and innovative practices include the fact that there has indeed been no real policy and financial support, and it is still difficult to make universities from different countries agree on content and methods. The lack of integration in the Bologna process agenda is also a problem.

3 What is the new interpretation on the role of ICTs in innovation?

While distance-learning and distributed learning continue to expand, e-learning encompasses far more. Not only does it involve methods for mass or long-distance dissemination of courses or materials to students, but it also places an emphasis on enhancing active learning, research-led learning and teaching, small-group teaching, and collaborative work. The focus is on fostering student independence, self-reliance, self-motivation, critical abilities, creativity and other characteristics.

The application of new technologies to the existing academic activities is becoming a standard element of institutional practice. Students naturally expect the availability and seamless functioning of such tools and services. The efficient central provision of facilities and support is a precondition for the successful adoption, integration, and development of e-learning practices, whilst the departments continue to work at their own developments and the institutional policy must accommodate those needs as well. Recognising and evaluating the benefits and costs of e-learning is an essential step and forms an integral part of institutional practice.

The recent term rhizomatic learning refers to the collective intelligence and rich user experiences that affect the concept of authority in educational systems. Dave Cormier (Rhizomatic Education: Community as Curriculum) refers to a “rhizomatic-knowledge creation process” that is overtaking traditional models. (A rhizomatic plant has no centre and no defined boundary; rather, it is made up of a number of semi-independent nodes, each of which is capable of growing and spreading on its own.) The term encapsulates a sort of fluid, transitory concept; the dense, multi-dimensional development and integration of several different sets of tools and approaches, appearing in diverse forms under separate settings, using all the multidimensional networking information technology tools, the social web, etc.

We should notice that the strength and the weakness of this approach is at the same time, that the content and the competence are legitimated by the collaboration in the networked system.

4 Recommendations

- Education systems are presently determined in the context of globalisation: systems are judged against the performances of education systems elsewhere, thus constant discussion with others and benchmarking performance against that of others is a necessity. Creativity, innovation and competitiveness are essential context elements. The demographic context is increasingly significant in the EU. The scarce resources must be used in a sustainable way.
- The strategic choices for education policy in the EU include a commitment to life-long learning and the necessary implementation of student-centred learning. ICT has much to offer to student-centred learning. In the evolved DE sector, due to its close relations to distance learning, these elements have been strongly present from the beginnings.
- Web-based tools are rapidly becoming the norm and content is accessed via portable devices. Technologically mediated communication, fluency in information and visual and technological literacy are becoming the norm; however, such literacy is not formally taught to students. The proliferation of tools that

enable co-creation, mashups, remixes and instant self-publication is recreating the traditional model of academic publication.

- The gap between students' and faculty members' perception of technology continues to widen. The renewed emphasis on collaborative learning is pushing the educational community to develop new forms of interaction and assessment. Higher education is facing a growing expectation to deliver services, content and media to mobile and personal devices. Education and training institutions should be prepared (many of them are already) to integrate this into their course delivery portfolio.
- Quality assurance has much to contribute to both lifelong learning and student-centred learning. Ways of identifying and certifying non-formal or informal learning should be found and it should be possible to assess credibly what has been learned.
- New business models are needed and education has to become pioneering itself by developing innovative tools for teaching and learning. Technology and structural developments are also supported by the emergence of new business models and situations, moreover by the uptake of financial capital in the sector.
- On the social side, the subject of the digital divide, particularly that related to the age gap, has been receiving greater attention.
- Significant shifts in academia, research, creative expression and learning create a need for innovation and leadership at all levels. Institutions are faced with a need to provide formal instruction regarding information, visual and technological literacy, as well as how to create meaningful content with today's tools.
- From a technology perspective, the following areas seem to be most important at present:
 - Technology: mobile e-learning; faster speeds via broadband and satellite; improved computer power and affordability.
 - Courseware: improved delivery systems that are compatible across computer platforms.
 - Digital literacy: greater investment in opportunities for people to step on to the e-learning platform.

The increasing performance of tools and networks has resulted in an increasingly structured and institutionalised impact on delivery and access, but also on the functioning of educational institutions and systems. The emphasis has shifted towards acceleration of the broadband, access, ubiquitous and personalised learning issues, etc. Web 2.0 and social networking tools are increasingly being adopted for educational use. Access to and portability of content is increasing as smaller, more powerful devices are introduced.

Calendars, contact databases, photo and music collections, etc. are increasingly and commonly stored on mobile devices. The effect of new displays and increased access to web content through the new devices can be observed.

- The momentum of the existing increased attention to virtual mobility in order to build intercultural dialogue, support the internationalisation of curricula and promote cooperation with third country universities (as an alternative to "brain-draining" strategies) should be maintained. Within the EU, virtual mobility is starting to be seen as a potential component of the Bologna process, bringing together joint titles in a cooperative way (rather than relying upon recognition of national degrees in different countries).
- At universities, in support of virtual mobility, there is a need to provide good information and advisory services. Better use should be made of technology for the better integration of existing services, particularly essential business services.

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Informal learning in the era of Web 2.0

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1 Introduction

This article focuses on individual development through e-learning and learning in communities. Individual development through e-learning ranges from education to training-related activities, together with any other technology-enhanced learning activities not necessarily mediated by formal educational institutions. Participation in online communities can produce both intentional and unintentional learning. The latter occurs when communities do not foresee learning as their main objective but generate learning as a side effect. The three e-learning territories that this article covers are:

Individual development through e-learning involves education and training-related activities mainly at home, together with any other technology-enhanced learning activities not necessarily mediated by formal E&T institutions. This territory is characterised by non-formal learning processes and especially by means of informal learning activities.

Learning communities are communities organised by individuals or groups of people to meet, share and learn about a specific subject. The learning taking place is non-formal, in the sense that it is not mediated by a teaching institution. The learning purpose is explicitly perceived and agreed on by the members, although not necessarily leading to formal recognition. Learning taking place in these communities may contribute to the development of skills and competences for the workplace, but also for private and social life.

Communities generating learning as a side effect do not foresee learning as their main objective. Establishing a relationship with other members of these communities is prompted first and foremost by a common interest or common value commitment resulting from either geographical or intellectual proximity, demographic similarity, common hobbies, belonging to the same NGO or charity, to name a few. These communities may take the form of popular chat rooms, blogs and fora in which informal learning takes place.

The constantly developing Internet environment has been shaped over the past years by applications and services based on Web 2.0 technologies. This is changing how we obtain, share, create, and organise information, communicate and participate and, through these activities, how we *learn*.

This article presents the findings of the Learnovation territory reports dealing with informal learning in both individual and collaborative contexts. The paper shows the recent changes and developments that have shaped informal learning opportunities and the ways in which innovation is fostered. The article concludes by presenting recommendations that should be taken into account to enhance and support informal learning and innovative development within informal learning.

2 Informal learning in the Knowledge Society

What do we mean by informal learning?

According to the vocational training policy (Tissot 2004) terminology, informal learning is:

“Learning resulting from daily activities related to work, family or leisure. It is not organised or structured (in terms of objectives, time or learning support). IL is in most cases unintentional from the learner’s perspective. It typically does not lead to certification.”

Furthermore, according to the European Commission (2000) *“Informal learning is a natural accompaniment to everyday life. Unlike formal and non-formal learning, informal learning is not necessarily intentional learning, and so may well not be recognised even by individuals themselves as contributing to their knowledge and skills.”*

Unlike formal and institutionalised learning, informal learning is not organised or structured, nor is it necessarily intentional from the learner’s perspective, and it can be said that informal learning is characterised by “unintentional learning” contrary to expected learning outcomes. All of this makes informal learning a barely-

defined or investigated area of learning. From a business point of view, training solutions can provide comfortable offers for expected and intentional learning; however, when it comes to unintentional informal learning, it is difficult to establish the exact target users/clients and the appropriate solutions. Different sources claim that up to 70-90% of all learning activity is informal.

The following table sets out the main differences between formal and informal learning:

Formal learning	Informal learning
Typically provided by an education or training institution	Resulting from daily life activities related to work, family or leisure
Structured in terms of learning objectives, learning time or learning support	Not structured (flexible) in terms of learning objectives, learning time or learning support
Leads to certification	Typically does not lead to certification
Intentional	May be intentional, but in most cases is non-intentional (incidental/random)

Table 1: Formal vs. informal learning (European Commission 2001)

The information society that surrounds us provides endless informal learning opportunities. New technologies have made information searching and processing faster and easier, and the efficient publication and dissemination mechanisms contribute to a broader circulation of information. This is explored further in the following section.

New ways for learning citizens

When Time magazine declared “you” as the person of the year in 2006, it focused the spotlight on the role of people to promote issues they consider important and the crucial role that technology can play in the process of individual empowerment.

“It’s a story about community and collaboration on a scale never seen before. It’s about the cosmic compendium of knowledge Wikipedia and the million-channel people’s network YouTube and the online metropolis MySpace. It’s about the many wresting power from the few and helping one another for nothing and how that will not only change the world, but also change the way the world changes.” (Time magazine, 2006)

Nowadays, it is impossible to speak or read about the Internet and its social impact without mentioning “Web 2.0”. In the daily life of Internet users, Web 2.0 technologies establish, through blogs and forums, virtual peer-to-peer network sites (professional or non-professional), wikis, bookmarking and sharing tools, tagging, own content creation and distribution portals, etc. Most of these activities support learning in an informal way, which offers people a vast and practically infinite universe of informal learning situations and practices with the aid of Web 2.0. With the aid of these technologies, people can create, share, exchange and remix their own content. The Internet is no longer a medium for learning, but a big playground in which people can search for whatever tools and contents they like.

Peer-learning and changing roles in terms of who teaches whom are also typical of the new virtual environments. The provider-consumer roles are changing, and learning is no longer about “consuming” the learning products, but more about each learner being able to create his/her own knowledge and learn with the aid of versatile resources and peers. For example, in a community, members can co-produce content and learn from the co-production process at the same time.

Furthermore, the activities related to Web 2.0 technologies, including informal learning, have highlighted the rapid development of new innovations, adaptation of new ideas, technologies and trends and their popular use: when a new tool or application is available, it is most probably first tested and used in the informal learning zone by “early birds” rather than in an institutionalised learning context. These new online services are user-centred and often even “user-co-built”.

The following table shows some of the popular applications used by millions of people around the globe.

Wikipedia en.wikipedia.org (Wikis)	A wiki is a collection of web pages designed to enable anyone with access to contribute or modify content. Wikis are often used to create collaborative websites and to power community websites. The collaborative encyclopaedia Wikipedia is probably the best-known wiki. It is written jointly by volunteers from all around the world. Wikipedia has also customised national sites. There are currently over 10,000,000 articles written in more than 260 languages.
YouTube	YouTube is a video-sharing site based on user-generated and rated content. Unregistered users can watch the videos, while registered users are permitted to upload an unlimited

www.youtube.com (video sharing)	<p>number of videos. Accounts of registered users are called "channels".</p>
Weblogs (blogs)	<p>Weblogs cannot be used only as an information database, but are also used as a medium for community building, communication and reflection. Among the various possibilities for interaction, weblogs usually offer a commentary function for feedback from readers and the opportunity for different authors to interconnect with one another's contributions by hyperlinks called "trackbacks".</p> <p>Learners on a course can use a personal weblog to document their own work or texts chronologically and publish their methods or results for their classmates or ask them for feedback and thereby gain new input and perspectives for the continuing learning process.</p>
Digg.com and Delicious www.digg.com www.delicious.com (folksonomies)	<p>Folksonomies are bottom-up classification systems that are produced by tags provided by users. The folksonomy tags (keywords) are usually freely chosen but can also be based on suggested vocabulary.</p> <p>Delicious (formerly known as del.icio.us) is a globally used social bookmarking service that allows users to tag, save, manage and share web pages from a centralised source. It is currently owned by Yahoo!</p> <p>Digg.com is a social news website made for people to discover and share content from anywhere on the Internet by submitting links and stories and voting and commenting on submitted links and stories. Voting stories up (digging) and down (burying) is the cornerstone function of the site. It has been argued that users have too much control over content, allowing sensationalism and misinformation to thrive.</p>
Facebook www.facebook.com (social community)	<p>Facebook is perhaps the best known social networking website.</p> <ul style="list-style-type: none"> – Facebook is made up of over 55,000 regional, work-related, collegiate and secondary school networks; – More than half of Facebook users are not students; – The fastest growing demographic is among people aged 25 and above; – It maintains an 85% market share of four-year US universities. <p>Looking at these data, one might say that Facebook is the biggest learning community the world has ever seen. Of course, some caution is needed: the majority of the activities that take place online have an extremely low learning value; nevertheless, the community is active and exchanges knowledge in a continuous and growing way.</p>
Second Life www.secondlife.com (social community)	<p>Joining an ICT-intensive community such as Second Life immediately exposes one to a number of learning possibilities and, at the same time, to a number of learning needs:</p> <ul style="list-style-type: none"> – In terms of language, since the most interesting events in the community seem to take place in English; – In terms of ICT skills, since one must master the Internet and PC skills for meaningful involvement; – In terms of social and communication skills (since the way in which people interact in Second Life definitely differs to the way they do so in the real world) and in terms of jargon, attitudes and behaviours. <p>Therefore, participating in such a community definitely has an indirect learning effect and raises a number of learning-related issues.</p>

Individual development through e-learning

Individuals acquire skills and knowledge, but also attitudes and values, from daily experience and from all educational resources and influences in their own environment: at home, at work, through hobbies, through conversations, through the media, etc. Informal learning takes place through spontaneous and self-managed activities.

With the emergence of Web 2.0, the e-learning 2.0 concept was launched rapidly. Advocates of Web 2.0 suggest that the Internet is moving from passive publication to active participation, that the Internet is one of the major knowledge repositories for personal knowledge acquisition (or informal learning) and will consequently put increasing pressure on traditional, formal E&T systems. Furthermore, it can be assumed that informal learning is already triggering non-formal or even formal learning processes. The following comparative table summarises the characteristics of e-learning 1.0 and 2.0, of which the latter benefits from Web 2.0 technologies.

(e-)Learning 1.0	(e-)Learning 2.0
Learning Platform & Learning Management Systems (LMS)	Personal Learning Environments (PLEs)
Acquisition processes	Participation processes
Multimedia (interactivity)	Social networks / Communities of Practice (CoP)
Externally provided content	User-created content
Curricula	Learning diaries/e-portfolios
Course structure	Communication
Tutor availability	Learner and peer interaction
Quality assessed through experts	Quality assessed through learners and peers

Table 2: From (e-)Learning 1.0 to (e-)Learning 2.0 (Ehlers et al., 2008)

The main issues that affect individual development through e-learning are summarised below:

- Educational content convergence is being developed through grassroots-based interest groups, using social computing amongst other things. The effects of these emergent “convergence dynamics” on social relations and on learning (providing opportunities for and barriers to learning) are not yet well understood.
- Recent studies show that, despite significant investment by the EU and Member States, around 43% of EU citizens are still classified as “non-participants” in the knowledge society.
- A further alternative position argues that new technologies provide a space for individuals to create a profoundly individuated social space that is insulated from others and external reflection, and is merely centred on “egocasting”.
- A key challenge is to acknowledge and try to reconcile these conflicting and sometimes paradoxical dynamics within goals based on active citizenship and participation.
- A more difficult set of challenges is faced by technology design when cultural contexts, as well as social relationships, are considered. Although it is becoming well accepted that social networking technologies require cultural embedding, practical ways of achieving this are not well developed.

Learning through communities

Two types of communities are addressed here: (non-professional) learning communities and communities generating learning as a side effect. Both are usually Communities of Practice (CoP). According to Wikipedia, a CoP is a “*process of social learning that occurs and shared sociocultural practices that emerge and evolve when people who have common goals interact as they strive towards those goals*”.

Web 2.0, which promotes more sophisticated social dynamics online, is not just a technological progress but, more importantly, a social and cooperative “lever” enabling advanced common knowledge creation, sharing and interchanging. This promotes learning and “collective creativity”. Communities of Practice based on Web 2.0 are typically built from the bottom up and they enable more effective exchange of tacit and explicit knowledge and building of personal relationships between individuals and groups that would otherwise be very unlikely to interact. Changing roles, not only in content provision but also in traditional roles of “novice” and “master”, are mixed, and this is replaced by the peer-to-peer approach and recognition system. Most of these Communities of Practice would not exist without the current technology.

The following table illustrates the positive impact that ICT can have on communities:

Role of ICT in communities	Characteristics
Enhancing learning and creativity	<ul style="list-style-type: none"> - ICT enhancing creative expression - Improving learning effectiveness with multimedia - Immersive environments - Game-based learning
Supporting sociability	<ul style="list-style-type: none"> - Showing and experiencing presence - Networking tools - Collaboration tools - Gathering and making implicit knowledge visible
New ways for accessing, organising and interacting - empowered learner	<ul style="list-style-type: none"> - Easy access to a great diversity of resources - New ways for participating - Lifelong personal knowledge management

Table 3. Role of ICT in communities according to Ala-Mutka (2009).

Also, the new technologies provide versatile and effective means of communicating which affect learning indirectly. Different tools, such as e-mails, mailing lists, blogs, forums, chats, videoconferencing, etc., offer endless means of asynchronous and synchronous communication. The communities can also be much wider and larger, favouring thematic and geographical extension.

The present challenges of communities are twofold: on one hand, policies should seek to better understand the learning dimension embedded in any offline and online community activity and uncap the learning dimension of this work. On the other hand, this should be done discreetly, focusing on transferring learning awareness from sectors in which it takes place openly to others in which it does not. At the same, learning should be made visible and available by fostering knowledge management approaches that fit with the dynamic and unpredictable nature of today's communities.

3 Innovation paradigms of informal learning

As mentioned above, Web 2.0 has significantly changed the ways of obtaining, sharing, creating and organising information, communicating and participating, thus favouring informal learning. The following table presents a comparison produced by the HELIOS e-learning 2000 and innovative e-learning 2010 projects. Furthermore, to exemplify the current practices in informal learning, some examples are provided on how Web 2.0 technologies already in use encompass a great deal of the i-e-2010.

<i>e-L 2000</i>	<i>i-e-L 2010</i>	<i>Web 2.0 and i-e-L 2010</i>
Distributes consolidated knowledge	Generates new knowledge	Personal and community weblogs, Slideshare, YouTube, Wikipedia, Wordpress, Flickr.
Is still e-teaching	Is owned by the learner	Personal Learning environments, weblogs, ePortfolios, collective ownership of results
May isolate the learner	Creates learning communities	Facebook, MySpace, Twitter, LinkedIn, thematic communities
Is delivered by a single provider/institution	Is the result of and a tool to support partnership	Communication tools. Exchange and benchlearning
Ignores the learner's context and previous achievements	Builds on the learner's contexts and previous achievements	ePortfolios, Del.licious, archives, tagging, folksonomies, restoring
Depresses the learner's creativity through transmissive logics	Stimulates the learner's creativity by enhancing the spontaneous and playful dimension of learning	Edutainment, game based learning
Restricts the role of teachers and learning facilitators	Enriches the role of teachers and learning facilitators	Peer-to-peer sites, asynchronous/synchronous communication
Focuses on technology and contents	Focuses on quality, processes and learning context	Focuses on the role of users in supporting their own learning and the learning of peers
Substitutes classroom sessions	Is embedded in organisational and social processes of transformation	Embedded Web 2.0 applications
Privileges those who already learn	Reaches and motivates those who were not learning	Enhanced accessibility

Table 4: From e-Learning 2000 to Innovative e-Learning 2010.
Source: HELIOS (2007) + examples of ICT (own adaptation)

By pushing for the proactive role of users in content and knowledge sharing and creation, Web 2.0 solutions and social networking are supporting the emergence of the learner-centred paradigm in informal environments. Monitoring and investigating the underlying processes as well as the outcomes of this phenomenon are key, as they could provide significant inputs for innovation in formal education and training systems. Particular attention should be given to the following dimensions:

- **Bottom-up - top-down.** The bottom-up approach implies that the initiative to act is taken by the individuals and groups themselves and is not dictated by authorities or directed institutionally. The bottom-up approach is self-managed, peer-supported and community-based. This applies, for example, to self-initiated portfolios, blogs and entire communities starting out as individual or small group initiatives.
- **Non-professional - professional.** Activity, and learning through it, takes place outside the professional context, although the skills obtained can naturally also be used professionally. The (learning) needs and objectives can be related to any trivial or day-to-day matter about which a citizen is curious.

- **Learning-centred - value-centred.** In value-centred action, learning is a secondary output after other purposes and not necessarily formally expressed. Value-centred actions develop a sense of affiliation, e.g. political/environmental/social activity group or a community of people suffering from the same disease.
- **Community-driven - individual-driven.** These two characteristics are not mutually exclusive, but rather reinforce one another. Although community-driven, the outputs of an activity are accomplished by individuals. Within communities, both the individual and the group dimensions are fostered and, while a member may have personal learning objectives, these interact with and are influenced by other community members and contribute to the “collective intelligence” of the community itself.

4 Conclusions and recommendations

Based on the above, we can present several conclusions that can also serve as recommendations for policy, practice and research.

- **Support for bottom-up, spontaneous initiatives.** Balance between supporting bottom-up community initiatives and institutional inputs to sustain the effectiveness of the communities.
- **Broadband access and digital literacy.** It is important to continue the support for the acquisition of digital skills and the support of multi-modal (mobile, wireless, cable) access to the Internet for households. It is important to spot and support segments of the population with poor e-skills.
- **Inclusion challenge.** Make sure that online communities are equally accessible by the entire population, especially when dealing with interaction. This can be done through actions on the provision of general ICT infrastructure to ensure e-access, greater emphasis on issues of e-accessibility and usability aspects, the building of individual capacity or e-skills, e-content and e-services development and the promotion of e-participation, e-democracy and active citizenship.
- **Support for content quality.** Market dynamics seem to lead the way forward. Most of the applications that enable the creation of these communities and the underlying learning are spontaneously created either by commercial or non-profit entities and, therefore, follow private interests. Support should be given to Open Educational Resources (OER) initiatives and any other scheme that leads to quality content.
- **Recognition and certification.** Recognition of informal learning and providing certification schemes that have the capacity to validate acquired skills, even if these are acquired through informal learning communities, should be developed. Learning should be made explicit in these communities without negatively affecting the attractiveness of these communities.

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learnovation



In which e-learning territory do you live?

- ➔ ICT for learning purposes within schools
- ➔ ICT for learning purposes in VET institutions
- ➔ ICT for learning purposes within tertiary education
 - ➔ Evolved distance education
 - ➔ e-Training of teachers and trainers
- ➔ Inter-organisational development through e-learning
 - ➔ ICT for virtual mobility of learners
 - ➔ e-Learning at the workplace
- ➔ Individual development through e-learning
 - ➔ Non-professional e-learning communities
- ➔ Communities generating e-learning as a side effect
 - ➔ Virtual professional networks

Learnovation project consortium members

- ➔ MENON Network (BE)
- ➔ SCIENTER (IT)
- ➔ UPC Universidade Católica Portuguesa
- ➔ The European Distance and E-Learning Network, EDEN (UK)
- ➔ P.A.U. Education (ES)

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