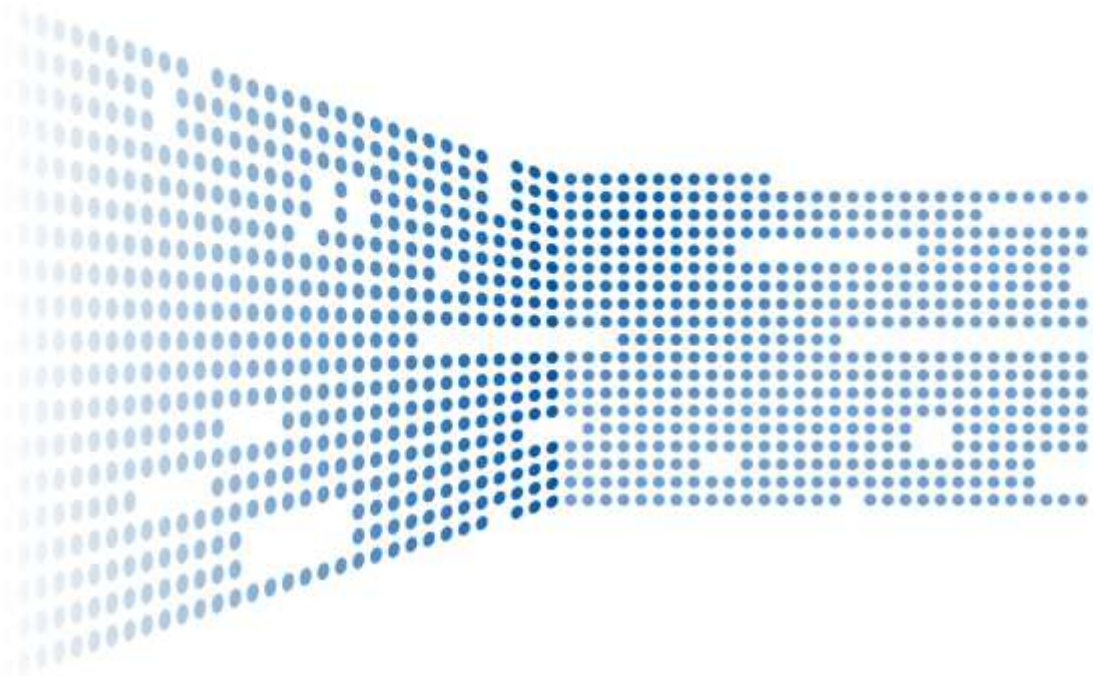
VISIR VISION REPORT

ANALYSING CHANGE TO SHAPE THE FUTURE OF LEARNING



The VISIR Consortium

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European Association for Distance Learning	EADL	NL
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OBSERVING TRANSFORMATION, BUILDING VISIONS

A dynamic instruments to shape the future of Learning through a smart use of ICT

Time to shape the future

Over the past 30 years we have been observing outstanding transformations in the way people learn, work and live. Technology has played a major role in this revolution providing new opportunities which were not possible to imagine a few years ago. Though, new challenges and questions have come along.

Big overarching goals – inclusion, citizenship, innovation and growth – require today new solutions of which education is a big part. We need to make sure individuals are fully prepared to participate in a radically different world, with its powerful opportunities but also new threats of exclusion. Education systems shall equip learners with fundamental key competences which cannot but prioritize digital and transversal skills, intended as the capacity to actively participate in the knowledge society and contribute to development and innovation. How education will look like and what it will be able to do is of the utmost relevance.

What do we know now about the future of education? Key words today are openness, personalization, collaboration and informalisation[1]. These elements capture the disruptive action of ICT in transforming learning as we knew it.

While ICT is part of the "problem" it is also lots of the solution. ICT plays a key role in re-inventing learning contexts and multiplying the ways people can access formal, non-formal and informal learning opportunities. The "magic" of ICT stems for the possibility it offers to increase universal access and intensive fruition of education, by overcoming the "time & space" constraints of traditional models whilst offering solutions which are becoming increasingly complex, enabling advanced learning experiences and ubiquitous collaborative processes on a global scale.

So far we have invested a lot in observing and forecasting change. However, a shared understanding of how ICT can support innovation and lifelong learning and serve new societal goals is still missing.

It is now time to run transformation and take initiative to make sure ICT can positively contribute to big societal goals. To this aim we need to start by filling a persisting "understanding gap" in ICT for learning. The theories of changes and the intervention logics utilised in the different LLL sectors must be analysed and coherently integrated in some common scenarios and recommendations for change targeted both to policy and practice.

To say it simply, we need to build a vision and turn it into action.

11 key domains of change where to observe evolution and build visions

This VISIR report Y1 is intended as a living document to build consensus around the main challenges and questions surrounding the future of education and a tool offered to stakeholders to systematically reflect on change and build a shared vision on how ICT can contribute to move towards desired directions.

The framework adopted is based on 11 domains of change in learning systems – meant as critical areas of transformation through which education systems can be mapped and the contribution of ICT defined.

1 REDECKER, LEIS, LEENDERTSE, PUNIE, GIJSBERS, KIRSCHNER, STOYANOV, HOOGEVELD, (2011). The Future of Learning: Preparing for Change. European Commission, Joint Research Centre, Institute for Prospective Technological Studies.

Figure 1. *VISIR domains of change*

The domains of change represent a structure to analyze and reflect together on the future of learning starting from two key questions:

What needs to be changed to respond to emerging challenges and achieve desired goals?

What contribution can be brought by ICT?

Each domain of change which is part if this report is to be intended as a self-standing paper and can be accessed independently. It identifies relevant key trends and challenges and the role that ICT can play to solve existing contradictions and contribute to desired goals (including some concrete examples from grass-root innovators to move from theory to practice starting from now).

Analyzing trends: what's really going on in Lifelong Learning in Europe?

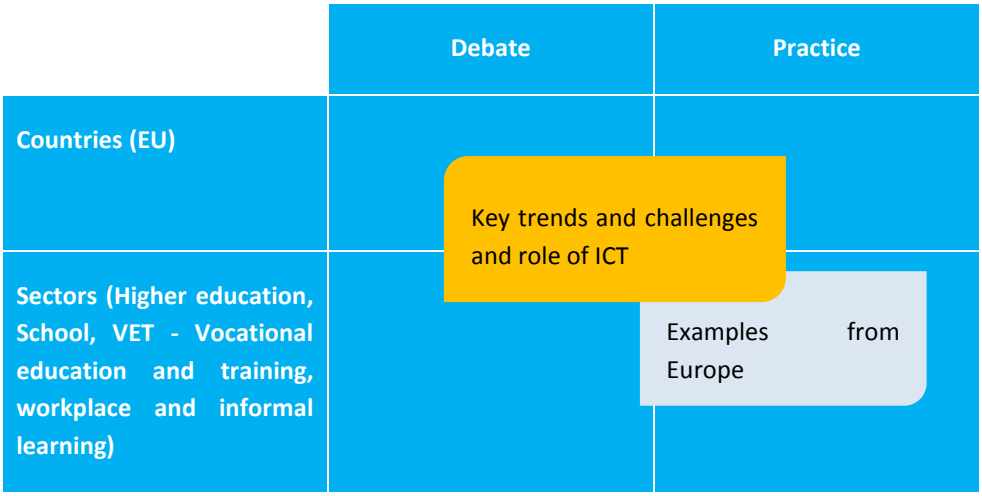
Can we say that a set of key trends and challenges are affecting the way we learn from Portugal to Bulgaria? The idea of a common lifelong learning area is an attractive one and makes life easier. However lifelong learning can be effectively boosted through ICT as long as we acknowledge actual difference between its several sectors and countries and design *ad hoc* solutions.

While inspired by strong overarching goals, a powerful vision of ICT differentiates short and long term strategies and approaches according to actual needs, readiness to change and viability of innovation in each area addressed. In each domain of change these varies significantly when looking at school, higher education, workplace or informal learning as well as when moving across countries.

That is why - while trying to identify some common trends and challenges - VISIR discusses carefully how (and if) these affect different learning sectors and countries, trying to take to the surface what is really happening in practice, beyond rhetorics and wishful thinking.

Each domain of change is thus analyzed according to the matrix below, crossing countries, sectors, debate and practice. By looking at convergence/divergence we attempt to grasp complexity and give back an instrument for planning action starting from now and from each stakeholders' areas of intervention.

Figure 2. *VISIR domains of change: trends analysis matrix*



While each domain of change is an autonomous access point, all together they offer a comprehensive map of transformation of education systems in the XXI centurie which helps analysis but also short and long term planning.

A dynamic tool and a living document

We do believe that vision building comes from consensus. We do not claim to offer ready-to-use and *one-size-fits-all* recipes for policy makers and practitioners.

A dynamic tool - the VISIR domains of change are provided as a dynamic tool to be used *à la carte* by stakeholders, who are free to build their own map to transformation. What is learnt, how it is taught, what is assessed, how motivation is kept high are all are interconnected issues. Any segmentation in learning is obviously artificial though useful to accompany reflection starting from one or more "entry points". Most of the issues are transversal as well as the examples provided on how ICT can help. What we offer is – per each domain – a perspective point which policy makers, practitioners and other stakeholders' can adopt according to their role, interest and preferences.

A wiki approach – The 11 domains of change form a living document open to be nurtured through consultation and research by stakeholders during the lifetime of the VISIR project and beyond. They offer an approach and a structure to analyze trends and evolutions in learning. Though the content can evolve together with the domains themselves thanks to the contribution of the broadest stakeholders' community in Europe.

A few words on methodology: filling the understanding gap through trends analysis and vision building

VISIR works to fill three gaps which prevent the full contribution of ICT to lifelong learning and innovation in Europe: an understanding gap, a networking gap and a mainstreaming gap.

Table 1. VISIR gaps

Understanding gap

The theories of change and the intervention logics utilised in the different LLL sectors must be analysed and coherently integrated in some common scenarios and recommendations for change targeted both to policy and practice

Networking gap

Flows of information among ICT-for-learning experts and practitioners from different fields and across European Members states must be made smoother and must be based on recognized "good practices which work"

Mainstreaming gap

The micro-innovation practices that exist around Europe must be made visible as ways to mainstream a meaningful bottom-up use of ICT for learning and must be the basis on which future scenarios and visions of European ICT for learning are built and discussed

A key activity of the VISIR project is trends analysis and vision building aimed at identifying, analysing and relating major trends development and change drivers related to the use of ICT for learning in Europe to overcome the "understanding gap" and build a long term vision on how to exploit the full potential of ICT as a leverage for innovation and change and as a way to increase digital and key transversal skills of European citizens.

VISIR's approach to trends analysis and vision building strongly relies on the legacy of a set of studies and projects in the field of ICT for learning carried out in the last 12 years.

In these set of studies, learning is analysed along "domains of change" which constitute transversal areas of transformation which are critical to the evolution of education and training system. In the vision building exercise, they act as the lenses through which change in education is understood - as the result of interplaying trends which are both exogenous (such as globalization, demography, ICT revolutions, values-sets) and endogenous to education - as well as the map to define a transformation agenda.

The one to change is a four-steps way, which include trends analysis, scenario planning, vision building and planning of influence.

The VISIR consortium has used extensive desk research and brainstorming activity to identify key trends in learning driven by ICT covering the macro level (E&T systems,), the meso level (organization which provide teaching and learning opportunities) and the micro level (teaching and learning opportunities themselves).

We have then analysed how these trends play an influence on each domain of change and are likely to produce new challenges or rather solve existing problems and policy trade-off. During this phase, we went in depth into scrutinizing those trends against different learning sectors, countries and dominating rhetorics.

To this aim we have used internal consultation relying on the several networks in the consortium which represent many European countries and lifelong learning sectors as well as on key literature and reports on trends in education in Europe, such as those from IPTS, OECD, EUA, EFMD, CRELL etc..

Finally we have integrated the results of the first VISIR stakeholders seminar – held in May 2012 in Bologna – which gathered experts from all over Europe and turned into a relevant re-definition of the original domains of change.

With the intention to produce a user-friendly paper for each domain of change, we have kept the language simple and opted for a non-academic format. With this priority in mind, some of our statements might be formulated in such a way to apparently loose complexity in favor of immediacy.

In fact, VISIR is not aimed to develop a scientific and evidence-based analysis of lifelong learning in Europe, rather to provide stakeholders with honest food-for-thought on key critical issues and start building their own visions for the future.

1 AIMS OF LEARNING SYSTEMS

SHIFT IN BALANCE OF AIMS OF EDUCATION

Definition

*The **shift in the "balance of classical aims"** of education (socialization, individualization, professionalization) in the 21st Century and the relation of learning to societal innovation.*

The role that society attaches to Education affects how Education and Training (E&T) systems are designed, organized and run by communities and individuals. This includes "what needs to be learned" and "why". Three main aims are traditionally associated with education: *individualization*, with the aim to raise autonomous individuals, *professionalization* to train workers, *socialization* to grow up citizens. All three aims co-exist within education systems but their balance is not fixed. It somehow responds to the requests that society makes on education in different periods of time. Ultimately, it reflects the visions of the world, which predominate during a certain historical period in a certain society and the formulation of responses to certain big challenges.

The 'classical' liberal-humanist learning paradigm needs now to be critically reviewed with regard to new 21st Century requirements in terms of learning outcomes: knowledge, skills, competences, metacognition.

Key trends and challenges

Increased weight of professionalization amongst educational aims. The stable period of growth enjoyed in the aftermath of the Second World War supported the rise of mass education in Europe. In favorable economic conditions, education was primarily meant as an equalizing leverage and the means to community building and citizenship. The predominance of the aim of socialization reflected the process towards the constructions of solid democracy supported by large welfare provisions and gave shape to European education systems for the era which followed. While socialization dominated, individualization and professionalization were also important under a steadily growing economy. In time of economic crisis – like the one we are experiencing now - education policy might be requested in the short-run to turn to professionalization and "employability" as its primary short-term goal.

Increased importance on individual competencies in learning communities within pre-Primary, Primary and Secondary Education. School education in the 20th century was mainly oriented towards socialization as it is the "universal" gate to citizenship and social inclusion. Nowadays, in the second decade of the 21st century, schools and education policy-making are trying to enhance their means to meet this challenge, by focusing somehow more on the autonomy of the learner and ownership of the learning process, preparing pupils to become autonomous, creative and critical learners (and thus citizens) rather than good re-producers of knowledge. Self-expression of the learners, in view of encouraging autonomy and creativity, is to be stimulated in classrooms; with multi-cultural integration representing the big challenge on the socialization side.

Self-directed professionalization: the Knowledge Economy opens up niches of opportunity for those who want to make a job out of their passion and merge individual and professional development. For these professionals, it is usually difficult to find exhaustive learning opportunities within current offer of traditional education and training systems. Profiting from the opportunities offered by technology, they are creating innovative learning paths which combine the nurturing of individual talents and the development of spendable skills.

Countries and Sectors

All aims of education are represented in the different education sectors with varying "versions of the balance"; however the focus on the individual's competences is much more associated with Higher Education, the enhancement of professional skills with the Vocational Education and training systems and the building of the social competencies (the socialization agenda) with pre-Primary and Secondary Education (including compulsory schooling). Although the different sectors maintain their own learning priorities and mandates as well as their specificities in terms of organization, education grades are now increasingly aligning towards a more even distribution of their "aims". This reflects the obsolescence of the fragmentation of education into grades and education sectors which worked well in a more stable, less fluid and not yet globalized world. Both school and vocational education are now converging towards a modus operandi where all three aims co-exist in varying "versions of balance".

On one side, both Schools and Higher Education Institutions are being pushed to acknowledge the need to move from subject matter (knowledge domain) and content-based learning experiences towards more process-based learning, to enhance competences, in order to prepare the pupils for their lifelong learning paths and enhance their employability. On the other side, Vocational Education becomes more attentive to the individual's talent and transversal competences, beyond professional skills, to equip young people with the means to cope with continuously change processes, tasks and –often – job locations.

Debate and practice

There are concrete examples of incorporation of elements of general education within Vocational Education and Training (VET) – particularly initial VET - in European countries which were traditionally oriented towards pure professionalization, like Italy for instance. There is interest within several European education systems for the dual model where education and work are more closely integrated; examples come recently from both France and Spain. Likewise professionally-oriented education at university level is being embraced. However, it is hard to say to what extent the new balances of aims will be translated into daily practice at the level of individuals and organizations.

The increasing policy focus on transversal skills development and creativity enhancement as educational aims will for sure generate strong debates. Indeed, while is is clear that EU parents strive to ensure a future to their kids, they can still hardly believe that skills like self-expression, capacity to live in a multi-cultural environment etc. will help future generations earning their livelihoods.

The European education system faces not only the challenge to shape future citizens and workers but also the challenge to remain competitive in comparison to the education systems of other areas of the world (such as BRIC countries), featured by different balances of the classical aims of education.

What can ICT do?

ICT can support better coexistence among educational aims by providing innovative solutions –individual and collaborative - to pursue individual development, social participation, and the development of skills valuable for work all at the same time.

This deals with the growing use of ICT in the classroom and elsewhere within the formal education environment, but also with their role in favoring learning continuity, specifically with respect to the non-formal and informal learning of individuals.

In school, examples already exist of the smart introduction of ICT to support more personalized learning processes, able on the one hand to foster creativity and individual talents of pupils while supporting socialization and education for active citizenship.

The rise of "self-directed professionalization" – although still an emergent trend - can teach us also something on the opportunities offered by ICT to smooth the fragmentation of individual learning goals.

In general, ICT favors the autonomy of the individual in integrating the learning input received from the education system, enabling the learner to autonomously correct existing rigidity in the aims and boundaries of each learning cycle to adapt them to individual needs and long-term goals. Those who want to make a job out of their passion and merge individual and professional development. For these professionals, it is usually difficult to find exhaustive learning opportunities within current offer of traditional education and training systems. Profiting from the opportunities offered by technology, they are creating innovative learning paths which combine the nurturing of individual talents and the development of spendable skills.

Some examples from Europe

Wallangues - Learning Languages as a gate to inclusion, employability and lifelong learning

http://www.wallangues.be

Wallangues.be – an initiative of the Walloon Region in Belgium - is an online learning platform available 24h that enables all Walloon adult citizens to learn up to four languages (English, French, Dutch and German) free of charge. The platform has been e integrated in the strategy and programs of several Belgian public institutions in charge of language training for unemployed citizens. These institutions follow-up on the progress made by their students, give personal advice and help keeping up motivation of adult learners. Wallangues has furthermore a dedicated team of trainers travelling all around the region all year round to animate presentation and quality assurance sessions open to all citizens

Team-Player – strengthening intercultural competences in initial vocational education through game-based learning

http://www.the-skillz.de/

The Team player project from North Rhine-Westphalia has developed a computer-based learning game for apprentices in the craft skills to develop intercultural skills during their apprenticeship. In this online game, apprentices act as the members of a music band ("The Skills") preparing for a music contest and are actively involved in the process of ensuring a successful performance. The game is aimed at developing intercultural competences, acceptance of otherness and diversity and ability to manage conflict as integral elements of a vocational training path. Team player is thus an example of integrating key transversal competences for citizenship in vocational education, intending those skills as an integral part of employability and inclusion.

2 CONTENT AND COMPETENCES

2.1 LEARNING CONTENT, CURRICULA AND COMPETENCES

Definition

The new requirements in terms of learning outcomes: knowledge, skills, competences, metacognition

The information society - characterized by complexity and fast change – sees knowledge production as distributed and any knowledge set at risk quickly become outdated. The capacity to manage information in the face of complexity and to deal with changing conditions is thus becoming a requirement to face individual and social challenges; the focus of education is shifting from transmitting crystallized knowledge to equipping people with transversal competences as well as the capacity to make links between different elements of information and to apply knowledge in context, with flexibility.

Key trends and challenges

From given sets of knowledge to processes and competences Within the information society, the focus of education is shifting towards transversal competences as a basis to ensure individual development, employability and active participation in society. These includes lifelong learning competences – namely reflective attitude, critical skills and metacognition – but also collaborative and social skills as well as proactivity, innovation and creativity.

Decreasing importance of sets of knowledge. The relativism and loss of fixed beliefs of the post-modern society favors a new attitude towards knowledge which is constructed rather than a "given datum". ICT has made available a giant set of resources, information and data and multiplied accesses to them. Individuals show a more proactive attitude in building their own set of resources to become knowledgeable about something rather than recipients of "truth". This trend is likely to increase attention to quality of information and literacy as a focus of education, while diminishing the "sacrality" of knowledge in the classroom (e.g. students allowed using books and laptop to do a coursework).

More local definition of content of education The focus on competences rather than set of knowledge in national curricula may favor increasing autonomy at the local level with respect to the definition of content, programs and activities. This in turn leads to more contextualized knowledge as the focus of education processes; the aforementioned competences are then developed within the learning context of pupils and the local specificities. However, such shift to competence acquisition might also bring convergence on standard competences and alignment with regards to standard assessment procedures.

More interdisciplinary education: The traditional separation between disciplines and subjects is in crisis. Curricula and programs need to be more interdisciplinary to ensure responsiveness to the changed social and economic context within which there is increasing demand for integrated profiles. The shift to competences as a goal of education pushes towards the design of more interdisciplinary learning experience – such as project-based learning and case studies – able to stimulate the development of integrated set of competences.

Development and generalization of innovative learning materials. The shift in key "learning outcomes" in education has also an impact on the development and spread of innovative learning material which are more adequate to achieve those learning outcomes, by allowing much more complex situation, better emulation of reality and Increased application of theory through projects anchored in the real world (i.e. simulation and game-based learning).

Countries and sectors

European countries are converging around the European Lifelong Learning Programme with its focus on transversal competences as a primary goal of education. There is also increased attention across Europe to the acquisition of integrated competences in learning processes rather than sets of theoretical knowledge. Although mediated by their specificities, such shift is common to learning sectors. In school - according to a recent OECD report on curriculum innovation - so-called key-competences approaches and student-centred approaches to teaching have been promoted in several curriculum frameworks, while cross-curricular or integrated studies are increasingly common in many countries (OECD:2012)[2]. The "competence" discourse – with its focus on transversal skills, innovation and creativity – is also penetrating Higher Education.

Debate and practice

The debate around key learning outcomes is a lively one. The traditional opposition persists between on the one hand the need for more generalist content and on the other hand more specialist education - especially in the professional sector (including vocational education and workplace learning). On the other hand, the shift to competences is perceived in some sectors – especially Higher Education - as a threatening to push towards education into over-professionalization.
Due to this, the transformation in the learning outcomes is still more expected than real in the formal education sector. In particular, in both in School and Higher Education it is difficult to move away from traditional approaches centered on the transmission of sets of knowledge. At the workplace as well, it seems that reality still clashes with theories and claims. When it comes to concrete daily access to the new available knowledge resources, learning content on the web, many employee are still forbidden to access social media and channels such as You Tube, Twitter, Facebook etc., being thus prevented to access large sets of shared knowledge and enter exchange with wider professional communities.

What can ICT do?

ICT can be adopted in education to support the development of transversal competences and metacognition processes.

New ICT devices and services - such as apps, tablets, smart phones - are already used in an experimental way in education to support active learning process based on contextualization. If used in a smart way, they can favor metacognition processes and stimulate competence development by requiring an active engagement of the learner with knowledge elaboration tasks and problem solving - also through collaborative processes.

Likewise, ICT can help increase the reflective practices of learners. New data tracking systems permits to record and map individual learning (i.e. e-portfolio and personal learning environment). Increasingly interoperable systems support the creation of meaningful individual paths and profiles across learning contexts, favoring meta-cognition and ownership of the learning processes.

The disruptive power of ICT is that they offer access to a variety of contents, opening up a learning process which was once confined to the classroom and structured by the teacher. At the workplace this include access to a variety of content and info such as blogs, professional communities and open resources, provided that web 2.0 tools are favored rather than feared by employers. As mentioned – problems do however arise with respect to the quality of resources and the information literacy of learners. An effort of education systems is required to support the development of necessary competences to be spent from school up to learning at work.

2 OECD, Bringing about curriculum innovations: implicit approaches in the OECD area, OECD Education Working Paper No. 82

Some examples from Europe

GenY – developing 21st century skills through collaborative learning

http://geny.sintlievenscollege.be

GenY is a "student-driven" project of the Sint Lievenscollege Institute in the Flanders which involve students of different ages and classes in identifying and "solving" a key problem in their learning processes through the use of ICT and attractive teaching methods

By involving pupils in the design of the learning process, GenY promotes their meta-cognition, problem solving as well as project management skills. It also strengthens their ability to learn collaboratively without the concrete support of the teacher.

I'GLOS – building together the learning experience

http://www.uweavit.org/home/uweavit.php

I'GLOS is an initiative to make eLearning attractive and cheaper by directly involving students in the design of challenging digital learning experiences in a specific subject, fully building on the abundance of resources in the web.

An interdisciplinary team of students constructs and transforms learning content, building an "I'GLO" - an Interaction Generating Learning Object - which consists of learning paths, conditional feedback and exercises, published on a Virtual Learning Environment. By focusing on the design and development of the learning content and process, students practice their "21th century skills", namely problem, solving, creativity, collaboration and critical thinking, ICT skills.

Mobile Mind Map – using mind maps to develop critical thinking

http://mobiilioppija.wikispaces.com/Mobile+mind+map

Mobile Ming Map is a Finnish project targeting students in vocational education - namely business and administration students - originated by the Finnish training centre Innoomnia. This project aims at strengthen critical and analytical skills by bringing students to address a theoretical subject in a way which stimulate critical thinking. Specifically, students carry out experts interviews then organize results in mind maps with Popplet iPad app, and share them in a wiki or blog, comparing and reflecting their mind maps' results with the group.

Global Marketing Competition – using online simulation to learn business by doing

www.globalmarketingcompetition.com

ESIC Business and Marketing School designed and launched one of the biggest online marketing simulations in the world, where students act as Marketing Directors of a Car manufacturer and have to take strategic decisions and implement them to compete on a simulated market with other players. Originally reserved to ESIC students and intended as a practical illustration of the marketing lectures, ESIC decided to allow access to the simulation to all students worldwide, in order to boost attractiveness of business education, thus adding an open and internationalization dimension to the learning experience.

3 ORCHESTRATION

3.1 ORGANIZATION OF THE TEACHING PROCESS AND THE LEARNING ENVIRONMENT

Definition

*The change required in the **teaching/learning process**, that fully takes into account the flexibility, autonomy, speed requirements of different groups of learners – especially with respect to the use of Web 2.0 technologies - but also keeps in mind the need for a "scaffolding structure" and for "meaning" that new models of ICT enhanced learning and informal learning bring with them.*

With increasing complexity and multiplication of learning contexts and flexibility (web 2.0, mobile learning, augmented reality, to quote some) the teaching/learning process is expected to undergo changes which will address both the aspect of autonomy *of* (and *in*) learning and that of the unity of time and space as dimensions of traditional learning contexts. In turn, new scaffolding models in the teaching/learning process and in the construction of meaning will be developed as a natural evolution of change in learning contexts.

Key trends and challenges

From teacher to student-centered: The traditional education model which was mainly centered on the teacher and the classroom is under pressure in Europe. The knowledge society requires education to raise autonomous (lifelong) learners and critical citizens rather than recipients of content. It pushes towards more learner-centered processes - able to support individual differences and autonomy in learning. This includes active learning strategies, challenge and problem-based learning, collaborative learning experiences. Teachers become orchestrators of learning strategies which demand more active engagement of the learner and act then as facilitator of autonomous learning processes.

Change in the learning context: Making the learning process more learner-centered means also opening it to the life experiences of the learner and supporting individual rhythms, initiatives and aptitudes in learning. The spread of blended modalities and the integration of ICT devices as legitimate learning devices in the classroom help in the design of learning processes which support individual differences and learning styles. This leads however to the un-bounding of time and space and de-structuring of traditional and classroom-based learning contexts, making them increasingly individually defined.

Supporting more autonomous ways to learning: ICT plays a key role in re-inventing learning contexts and multiplying the ways people can participate in formal, non-formal and informal learning over their lifetimes, permitting them to have complex and advanced learning experiences. Designing and making sense of the multiplication of learning contexts as well as helping to build meaning becomes thus a fundamental task of teachers and facilitators. This pushes towards new scaffolding models which guide and orient individuals in using available ICT resources in ways which are relevant and coherent to their learning needs.

Traditional model of knowledge delivery questioned by the rise of OER: the new usage of the education material proposed by the Open Education model and the new associated facilities question the traditional model of knowledge delivery and in particular the usual flow of material produced by the experts (from the academia or the practitioners) and delivered to the users (students or participants). Initially one-sided it now evolves into a circular process. This raises issues of quality but also changes the current landscape and *power relations* in teaching and learning as new actors now appear on the science.

Countries and Sectors

The shift from teacher to learner-centered features prominently in the debate in most European countries and is claimed in many official documents. It cuts across all learning sectors, even though the balance between teaching and learning changes from school to workplace learning or to informal learning and the role of the teacher thus changes as well. Indeed, the informal sector is the breeding ground of innovative learning processes, based on both personalization and collaboration, becoming increasingly centered on the individual and peer-support. Here Web 2.0 has played a key role in transforming the relationship between teachers and learners, moving from transmissive models (those of early distance learning) to collaborative processes and peer learning. Formal education is more resistant to abandon traditional models within which the teacher is the one who structures knowledge and the classroom is the center of the educational process.

Debate and practice

The authentic transformation of teaching processes is slower than what claimed in the rhetoric. The idea of turning the role of teacher into that of the orchestrator or facilitator of individual and collaborative learning experiences does not find yet full implementation in practice. In the formal sector the classroom-based model contributes to maintain teacher-centered education. Consensus is missing around the role of the teacher in the 21st century. The classical role of the teacher is defended by some reformists who fear the loss of main points of reference in education as commodification increases and the transfer of responsibility onto the individual learner is exacerbated. The way to knowledge (making sense of overwhelming information availability) is seen as something that needs to be structured rather than left to the choice and skills of individuals in a market of scattered learning opportunities.

What can ICT do?

ICT acts itself as a powerful driver of change in the teaching process and it may help individuals to develop more learner-centered experiences and – in parallel – to support the development of new scaffolding models which are adequate to ensure – in each sector - the right balance between learner autonomy and support in learning.

From the point of view of the individual, ICT has an emancipatory power on the learner who can autonomously build his/her own learning path and adapt it to his/her pace of learning. From the point of view of the teacher, ICT allows them to orchestrate complex learning experiences which are built around the learner and their life-wide learning continuum.

For sure a challenge still to be faced is the resistance of most teachers to adopt ICT, linked to the limited availability of up-to-date enabling infrastructure and adequate training especially in formal learning sectors.

Some examples from Europe

Flipped classroom – overturning traditional school model to support effective learning and motivation

The flipped classroom is a form of blended learning in which the roles of homework and classroom teaching are reversed. In flipped teaching, the learners first study the topic by themselves, typically using video lessons. Class time turns into a workshop where learners can inquire about lecture content, test their skills in applying knowledge, and interact with one another in hands-on activities. The role of the classroom teacher move then to tutor the learner when they become stuck, rather than to impart the initial lesson, while the classroom become an inter-active space.

Scaffolding Learning (ScaLe) with Twitter – using twitter to reproduce clinical teaching

http://hesas.glam.ac.uk/simulation/scale/

the ScaLe project - funded by JISC in the UK and targeting nursing students - aimed to explore the use of Twitter as a "teaching tool" to scaffold learning and engage students in critical thinking and decision-making, by using micro blogging as the tool to comment and follow up on simulated clinical cases (videoed clinical simulations). Basically twitter became a scaffolding instrument transferring elements of real-time, hands-on clinical teaching within the academic setting and reducing the theory-practice gap. This enabled to reproduce a learning experience similar to clinical teaching at distance, easy to access anytime and anywhere and according to students' pace.

4 VALUING LEARNING

4.1 MOTIVATION, AWARENESS AND VALUE OF LEARNING

Definition

The change in strategies required to generate and maintain the ***motivation of different groups/classes of learners*** *in different learning contexts, allowing them to develop their identity as lifelong learners*

Motivation and engagement with one's own learning process have been recognized as cornerstones of successful education; they act as a gate to lifelong learning by favoring ownership and understanding of the learning experience and commitment to engage in further learning. Motivation is linked to a sense of protagonism in the learning experience and thus requires strategies able to understand and fruitfully build around the life-wide learning background of the learners, taking into account how this affects stimulus, attention, construction of meaning for different learning groups.

Key trends and challenges

Personalization instead of standardization of learning: Individuals are motivated to engage with learning, when the "what" and the "how" they learn are coherent with their interests, preferences and aptitudes and able to value personal background (including what they already know!). Personalization of paths and individualization of strategies correspond to the key to foster intrinsic motivation and ensure engagement with the learning experience. ICT offers innovative content and attractive solutions to individuals to learn what they desire at their own pace. Personalization is now gaining space also in formal learning sectors, thanks to increased modularization of paths and learner-centered approaches.

Integrating the learning contexts of individuals: Learning systems are increasingly acknowledging the importance for motivation of integrated learning paths which are nurtured by the life-wide learning experience of the learner. Continuity in learning produces meaning and develops the identity of the individual as a lifelong learner. It overcomes the fragmentation of experience, favors self-reflection and metacognition and supports the continuity between life and education, stimulating further engagement in learning.

Personalized assessment supporting awareness and motivation in learning: Assessment is key to stimulating motivation. With learning becoming more individualized and self-managed, evaluation supports awareness of the entirety of the individual learning experience and orients the learner towards the most adequate formal, non-formal and informal learning opportunities to pursue individual goals. The spread of personal learning environment, learning analytics, natural language processing systems, e-portfolio etc., offer individuals a set of resources to systematically monitor, track, assess and re-direct their own learning process.

Countries and sectors

Throughout Europe it is recognized that individual motivation to learn is key to support success in education. Where the lifelong learning concept is less rooted – however - extrinsic motivation (namely getting a job!) prevails on personal engagement and the strategies adopted to keep people in education reflect this approach. In times of crisis – like the ones we are experiencing now – the promise of a quick (re-)employment could become the driver of motivating strategies, reducing attention to lifelong learning goals.

The differences are particularly prominent among learning sectors, with informal learning naturally oriented towards intrinsic motivation and VET primarily related to immediate employability.

Debate and practice

Adult learning is for sure a field where motivation and sense of ownership are strongly linked, as one's learning process is related to the building of a skills and competences portfolio for one's own career and at the same time responding to the needs of the employer. To enhance such a motivation and sense of ownership appears more difficult in formal education and training, where motivation still seems to be connected to the achieved marks rather than to what has been learned and how this contributes to make a person a future worker and a citizen.

Although the scientific literature is rich in contributions on what motivates learners to learn and examples of small scale success stories, not much of this available knowledge is systematically used and practice often fall much behind what could be expected. The responsibility of this is often attributed by teachers to the size of the classroom and the lack of time to adopt active learning strategies in view of compelling curricula objectives. Frequently, the results of this situation is the well-known exclusive focus of learners on what will be formally assessed in the exams.

What can ICT do?

ICT can play a key role in stimulating and maintaining motivation to learn, by offering the possibility to build individualized and contextualized learning paths – seconding learning paces and preferences - as well as to reflect and maintain control over the learning process. This supports sense-making of what is learned and motivation to engage in further learning, by positioning the individual at the center of his/her life-wide learning experience.

Augmented reality, mobile learning, game-based learning and simulation permit to implement learning strategies based on contextualization which put knowledge in context, hereby enhancing meaning and sense of what is learned. Likewise new workplace learning services such as "work integrated learning" and "targeted learning" favors the development of competences in context but valuing individual background in continuity with personal learning interests and increasing integration of formal and informal learning.

However - ICT may also have a disruptive effect on motivation towards more traditional forms of learning which are obliged to rethink the way they stimulate engagement and investment of individuals.

Some examples from Europe

LiveTime - developing management skills through integrated work-based learning and personalized improvement plans

http://www.brightwave.co.uk/livetime-learning

Livetime is a product of the private company Brightwave in the UK, aimed to develop and strengthen business skills of managers at the workplace. It is based on a Live synchronous learning platform used to deliver over 100 bite-sized, 20-minute live online training sessions, each concentrating on a handful of key points and learning objectives and aiming at providing 2 usable action plans to encourage individuals to reflect and apply their learning back at work.

While participants can access any session at any time, they are all provided with a personal improvement plan that they can work through with their manager to agree which sessions to attend and what goals are related to each topic. Likewise a carefully trained facilitator support the learning path with a personalized approach, suggesting further learning resources and objectives right after each session.

5 ASSESSMENT

5.1 ASSESSMENT AND CERTIFICATION

Definition

The change required in ***assessment and certification methods*** *in a world in which information and learning sources are much more abundant than in the past and in which learning achievements should be recognized independently from the method and place of acquisition –coherently with the developments required by the implementation of the European Policy on Lifelong Learning and specifically by the EQF and recent communication on Validation of Informal Learning Achievements*[3]*.*

In order to make lifelong learning and life-wide learning a reality, it is necessary to develop and consolidate a shared language to value and compare the learning achievements of individuals (no matter how they have been acquired and where). This will permit to favor recognition of learning, hence mobility, employability and further engagement in learning through modularization of paths. Assessment needs thus to change accordingly in order to ensure that learning achievements are measured with respect to the different dimensions of learning at different levels (competences, skills and knowledge), consistently with the EQF.

Key trends and challenges

The shift to learning outcomes. In the move towards integrated lifelong learning system, assessment and certification shift their focus to the learning outcomes of individuals, independently of where they have been acquired. Opportunities and access-points to learning have multiplied and individuals acquire competences and knowledge across different contexts and experiences. The assessment of learning outcomes permits to value the learning patrimony of individuals acquired across a life-wide experience and ensure horizontal and vertical mobility in education.

Alternative assessment approaches and new certification systems. New assessment approaches are appearing associated to learning opportunities blooming outside the traditional offer and in the informal sector. The OER movement is developing a whole set of assessment practices for the full take-off of Open Education; these includes Open Assessment Resources, assessment fees and open badges1. Likewise, new forms of assessment supporting self-directed learning are now available for individuals to support their learning paths and track it within personal learning environments. New forms of social and peer assessment are gaining importance to assess learning in social networks and communities.

"Organized freedom" in complex learning ecosystems. The multiplication and diversification of assessment strategies, contexts and providers contribute to the shift to learning outcomes as the basis of new interoperable certification systems. These shall be able to capitalize on the different assessments and certifications an individual collects through learning contexts. Policy shall establish regulatory frameworks and quality assurance systems which ensure dialogue and interoperability between different certifications. This includes the development of systems for the validation of learning which build upon individual assessment paths.

[3] EC (2012),Proposal for a COUNCIL RECOMMENDATION on the validation of non-formal and informal learning, http://ec.europa.eu/education/lifelong-learning-policy/doc/informal/proposal2012_en.pdf

Countries and sectors

European countries have different approaches to assessment in education, ranging from models where teaching/learning is completely separated from assessment to models where traditionally assessment is organized by an educational provider at the completion of a learning process. For years the European Union has been promoting a common approach to assessment and certification – based on learning outcomes as the basis to validate formal, non-formal and informal learning. Despite its several initiatives, convergence at European level is still slow, as the delay in the full implementation of the EQF shows.

Openness towards new forms of assessment and certification varies a lot across learning sectors. Some areas – notably adult learning - are more ready to certify competences acquired informally. Others are more reluctant to open up their system, for reasons which are technical, economic, organizational but also political in nature. The informal sector is not surprisingly the one where innovative forms of social assessment of learning are gaining weight. However so far, they are recognized and keep value only within the context and communities where they have been generated, maintaining separation rather than continuum among different Lifelong Learning sectors. At the workplace – for instance – it is still difficult for HR department to value and recognise the competences that employees gain when learning at the work place through the new instruments of web 2.0 and social media (i.e. collaborative online discussions, webinars etc.) and in the absence of traditional exams and certification processes.

Debate and practice

The mainstreaming of certifications which are separated from a course and value learning outcomes of individuals is still a long way. Beyond cultural and political barriers, it is hard to change assessment strategies to make them focused on learning outputs. Interesting examples exist – like TOEFL and IELTS – and come not surprisingly from the Anglo-Saxon area. As stressed in many studies on innovation in education, assessment is the area which lags behind the most within the ongoing transformation of learning. Outdated assessment approaches continue to be applied (by regulation or by tradition) to innovative learning processes slowing down authentic innovation in European learning systems.

What can ICT do?

ICT offers a set of instrument to support innovative approaches to assessment: to evaluate the life-wide experience of the individual and coherent with the new and multiple ways of learning enjoyed in diverse life contexts.

Instruments such as the e-portfolio or learning records enable the collection of objective evidence of scattered learning experiences and meanwhile to stimulate reflection and awareness on one's own learning process and its outcomes and give it coherence and meaning. Likewise ICT can support social assessment approaches which can contribute to make informal learning explicit and give it a socially recognized value which can be spent in other contexts, including the formal ones.

Within the learning process, ICT can offer instruments in the hand of both the teacher and the individual to support an iterative process of integrated assessment with a formative purpose (through for instance learning analytics or Just In Time assessment, social media).

Some examples from Europe

MOOCs & OPCOs – acquiring spendable credits through open education

A new trend supporting the flexibility, collaboration at the work place are the new online learning formats Massive Open Online Course (MOOC) and the Open Course format (OPCO).

Throughout the last two years several Open Course Format were organised for instance in cooperation between different German universities and institutions, e.g. OPCO 2011 http://blog.studiumdigitale.uni-frankfurt.de/opco11/ or OPCO 2012 http://opco12.de/ . By participating in this course, learners have the opportunity to get a certificate or acquire credits if they complete required exercises, participate regularly in the online courses etc. This can be thus of a higher value to them than "only" participating in e.g. social learning communities.

The CodeAcademy initiative – Integrating multiple assessment tools to be managed by the learners

www.codeacademy.com

Started as independent enterprise by two software developers, the CodeAcademy is an innovative platform for learning IT codes which combines the step-by-step teaching approach in a laboratory environment, fully integrated with assessment and badging (including social media, scoring, badging and practical exercises integrated directly into the system).

Following the successful launch of lessons in several language, Code Academy opened up its learning platform to allow for other persons to build and submit lessons into the platform, extending the range and depth of material on offer.

Developing Diagnostic Assessments Project – designing advance assessment tools for formal education

http://www.edu.u-szeged.hu/edia/

The developing Diagnostic Assessment Project was an Hungarian large scale initiative aimed to devise and test an online formative assessment system for the first six grades of primary school able to track students' individual development, diagnose learning difficulties, identify causes for failure and support different solutions.

The activities of the project included: Devising assessment frameworks for reading, mathematics and science for the first six grades of primary school, Developing item banks, Creating a platform for online testing, In-service training of teachers to prepare them to use the system, Devising diagnostic assessment instruments for students with special educational needs and developing special computer interfaces for them, Meta-analysis of the data of national and international assessments.

The design of the project allowed to devise a large number of items both on paper and on computer, to build item banks and to carry out research on comparing the achievements and item parameters on the tests using different media.

6 FUNDING AND GOVERNANCE

6.1 PUBLIC FUNDING, MARKET DYNAMICS AND THE GOVERNANCE OF LIFELONG LEARNING SYSTEMS

Definition

The change required in ***resource allocation and investment*** *to face demographic change (progressive shift from youth to adult learning) and allow the long-term sustainability of education and training in an ageing Europe and the subsequent* ***pressure for change which is produced on the governance of Lifelong Learning***

Demographic change coupled with the increasing attention to lifelong learning as the focus of education policy is putting pressure on resource allocation and giving rise to innovative strategies to make education and training system sustainable in the long term (including access and quality of provision). The pressure for increasing universal access to quality education, reflecting the democratization of learning and its recognition as a key asset for participation, clashes with budget cuts and the difficulty for the public sector to support individuals in the development of learning paths which are increasingly lifelong. This might affect distribution of resources among education sectors and levels, related education providers and changing distribution of cost between the state, the individual/families and other stakeholders (i.e. companies, employers in general). New adequate governance paradigms needs to be sought to make sure lifelong learning contributes to innovation, growth and inclusion.

Key trends and challenges

Redistribution of cost and investment in society and increased pressure for participation in governance. Public budgets struggle to cope with higher investments required to achieve lifelong learning on a universal basis. Society is thus increasingly asked to share the costs of education as this is considered a key asset for individual employability, competitiveness and local development. In turn, educational institutions are pressed to become more responsive and accountable to stakeholders. Individuals, families, the employers, local authorities all want to have a say on education as they increasingly acknowledge its key value and accept to share its costs.

New actors in education: new horizontal subsidiarities in Education? The largely diminishing public budget available for education(combined with higher investment required) pushes the state to diminish its role as THE education provider in view of relying on the multiple learning opportunities now offered to individuals across society.

Thanks also to ICT, new informal and non-formal spaces as well as actors are gaining visibility in generating learning and innovation at the periphery of traditional education systems. They substantially contribute to new societal challenges and urgent needs which traditional learning systems sometimes fail to match.

Likewise new actors and learning providers are entering the education domain. They propose ICT supported solution to match new learning needs – special education, adult education, re-training and lifelong learning for employability – and may compensate for the withdrawal of the state or its inability to cope with increasing learning demand in time of budget cuts. Private learning provision is expected to grow and re-design market dynamics in education. Big market players are now proposing their own “educational brands”. New forms of public-private partnership may rise to enable the integration of advanced ICT-supported learning provision to ensure universal access to quality education in time of crisis.

Increased horizontal subsidiarity in learning will put a pressure on education systems to integrate brand-new subjects into the governance of lifelong learning, finding new valuable mechanisms to define more responsive policies.

Countries and sectors

Changes in funding and market dynamics are observable everywhere in Europe. All European countries are pressed by the challenges of fulfilling increasing education needs in time of budget cuts and decreasing resources; they are increasingly asking society to share the cost of lifelong learning. It is in particular in the Higher Education sector that pressure for accountability and responsiveness has risen dramatically; in this time of economic austerity, university has started to be considered increasingly as a private investment while at the same time there is growing recognition of its key role in contributing to economic and social innovation of society.

Today the call for "sharing the burden" and the related pressure for increased participation concerns primarily higher education and continuing professional development. However the pressure for participation is increasingly penetrating all education sectors, including school and initial VET.

Debate and Practice

Demographic evolution in Europe and serious unemployment rates in several countries have pushed the debate on allocation of economic resources in the spotlight. However, very few people would full-heartedly subscribe a recommendation to shift substantial resources from initial education to adult training and education. Schools and universities' most traditional activities are often under economic pressure and difficult to modify – from the point of view of productivity – at a large scale. On the other side, quality and productivity of adult learning are difficult to measure due to their variety and this element discourages increasing public investment.

In time of budget cut, the state might be tempted to turn its role from "providing education" to "activating people to learn", by supporting individuals in entering lifelong learning through incentives and leveraging employers' investment in education. The latter may however have serious difficulties to do so in time of economic crisis and may instead rely even more on public subsides.

Furthermore, even if more socially responsible participation of private actors in education are welcome in principle and effective in the short-run, it is true that the intervention of private actors is still regarded suspiciously as education remains, in most EU countries, perceived as a public good.

What can ICT do?

Ongoing technological innovation has a disruptive potential both for the cost of education and the institutional context of learning.

On the one hand innovation may help stem the increasing costs of lifelong learning and ensure universal access to quality education at all stages in life, in the form of highly advanced learning experiences. As mentioned - ICT offer the possibilities to deliver learning at distance or integrate new forms of learning (i.e. mobile learning) within traditional offer to make it fit for specific needs of a segment of the population (not necessarily adults). This includes for instance the integration of effective solutions to include different at-risk students (drop-out, students from remote areas, pupils with ill-health, foreign students) in education.

The Open Education movement is also pressing from the periphery proposing a revolutionary educational model which is not based on proximity access and is free for individuals. It shifts however the need for investment to infrastructures and maintenance of the system.

In the meantime ICT breaks down traditional barriers which have favored the consolidation of the closed education system, based on top-down provision and built around teacher-centered and classroom-based concepts of learning. ICT can push towards the development of new institutional and policy frameworks in education to adapt to a changed scenario. This include the shift from education provider to regulatory framework (including quality, access, learning recognition) which support active lifelong learning policy by creating favorable conditions for self-directed lifelong learning paths, including scaffolding and guidance framework.

With resources and services available and accessible on a global scale thanks to ICT, investment is expected to be directed less to content development, teaching service and courses organization and more towards guaranteeing access to ICT supported services and protect users, hence towards infrastructure, privacy regulation and access rights and quality assurance frameworks.

What up to now has being mainly a peripheral, additional element of institutional framework strongly based on traditional model - such as some emerging mechanisms for learning recognition and open education policies – is envisioned by some in the long run to become the informing principle of lifelong learning policy built around the individual learning path and going from certification of formal education to validation of diversely acquired learning outcomes (Ala-Mutka, 2010).

Some examples from Europe

Book in progress – cutting off costs of school books through OER solutions

http://www.bookinprogress.it/

Bookinprogress is a project runt by a network of 75 Italian secondary schools who work together to produce textbook for their students, so to face the high cost of school books for families and meanwhile ensure high didactical quality through collaboration. 800 Individual subject teachers from different schools work together on an online platform to produce and update a common textbook which is then available to all schools in the network via electronic distribution. The working method is collaborative, leading to the joint production of a common text-book that is then shared in the network, as an "open resource".

7 INTEGRATION

7.1 LIFELONG LEARNING (INTEGRATION OF FORMAL-NON FORMAL-INFORMAL LEARNING)

Definition

The change required to reach a ***real integration of formal, non-formal and informal learning*** *in order to offer individuals, organizations and communities a chance to better link learning to innovation and enhance the potential of each learning opportunity*

Fruitful integration of learning occurring in formal non formal and informal contexts is key for unfolding learning potential at individual, organizational and community levels as well as favoring innovation. This process of integration affects the way learning is designed and implemented and the boundaries set between learning context (i.e. in and outside of school walls). With learning developed in non-formal and informal contexts increasingly "owned " and managed by the individual learner in coherent ways and being made explicit to the system, the overall amount of learning in the system increases in quantity and quality, as real integration is more valuable than the simple "sum" of fragmented learning paths. The valorization of this learning capital at the macro level extends the logic of the Learning Organization at the level of education system.

Key trends and challenges

Informalization of learning and integration of learning forms. The spread of technology is increasing the informalization of learning experiences and challenges the separation between school and home life. The ubiquity of ICT, cloud and social computing, mobile devices and services, support a learning continuum across life contexts. They exert a pressure on education systems to acknowledge, support and recognize learning in its entirety, becoming the hubs of personal life-wide paths. The traditional correspondence between learning context and learning modes is entering a crisis; formal education is opening up to informal learning components and informal learning areas are becoming more structured. On the assessment side, a number of methodologies are being developed to favor the integration of formal, non-formal and informal learning of the individuals. These includes new assessment approaches which are headed towards a comprehensive evaluation of the competences acquired either in formal, non-formal and informal context.

Institutional support for lifelong and life-wide learning. European countries are working to establish supportive policies and regulatory frameworks which favor increased collaboration among education systems, transparency and mobility. A key element is the establishment of national qualification frameworks linked to the EQF. By expressing the level of any qualifications in terms of competences, skills and knowledge acquired, NQFs supports at the institutional level the integration of learning contexts and value individual learning achievements independently of the context of acquisition.

Individual ownership and capitalization of the individual's learning experience. The recognition of learning acquired in the continuum of life experience supports increased ownership on the part of the individual of his/her own learning path. Technologies on the other hand drive the bottom up push for integration. The interoperability of systems, mobile learning, personal learning environment and data tracking supports individuals in merging formal, non-formal and informal learning in coherent learning narratives through reflective practices.

Countries and sectors

The concept of Lifelong Learning does not enjoy the same acceptance across the European area. In a rough breakdown, Northern Europe – especially Scandinavia – has been the forerunner of lifelong learning approaches to education. Instead, the concept struggles to fully penetrate the rest of Europe, notably the South. Here, the idea of "learning all along one's life" can be perceived as a top-down imposition rather than an individual opportunity. This adds to the persistent fragmentation of learning sectors which resists the pressure for integration and dialogue between education providers, learners and employers. In addition to that, Lifelong Learning carries a strong ideological burden as a concept with a socialist imprinting to which the Continuing Professional Development concept – much more focused on economic/professional needs – is opposed. It suffers the traditional opposition between those who consider education as a public good and those who believe it pertains to the sphere of individual choice. A growing convergence is however observable within the scope of the European initiative in the field, with civil society represented by EUCIS calling for a Renewed Memorandum in Lifelong learning 12 years after[4].

Lifelong learning enjoys in any case different fortunes in each learning sector. Adult learning is the breeding ground of lifelong learning and integration "life experience learning". As mentioned however, in times of crisis this sector tends to lose the attention of and funding from governments. Higher education, school and VET are all opening up to the idea of integrating learning contexts - i.e. promoting access via validation of informally acquired learning and supporting informal learning processes to integrate the formal one.

Debate and practice

Despite the rhetoric, the integration of formal, non- formal and informal learning is neither a consolidated practice nor yet available to individuals in education systems. As mentioned - a trend exists in formal education of increased integration of learning forms. In higher education for instance this deals with the rising of social communities related to topics and courses which are given value as part of the learning process of students. In general however formal education systems tend to be reluctant to acknowledge other learning contexts and integrate them as a daily practice. Likewise, institutional mechanisms for recognition hardly take off, making the individual way to lifelong learning a lonesome one and confining important areas of societal learning to non-recognition.

On the other hand, learners themselves are quite reluctant to merge formal learning with non-formal and informal learning related activities, so the real question becomes: should these three areas be merged?

Effective guidance models and brokerage information systems about the available formal/informal/non formal learning opportunities could probably support lifelong learners and avoid obstacles related to the permeability of formal learning towards non formal and informal learning experiences.

What can ICT do?

As mentioned above, ICT can push forwards the practice of lifelong learning as it facilitates the integration of learning experiences starting from the individual rather than the system. This requires however the necessary competences on the part of the learner to make sure ICT serve the most authentic purpose of lifelong learning.

4 *http://www.eucis-lll.eu/eucis-lll/wp-content/uploads/2012/03/A-call-for-a-renewed-Memorandum-on-Lifelong-Learning-EUCIS-LLL1.pdf*

Some examples from Europe

Creative Hive – using ICT to integrate, showcase and share individual learning achievements

www.creativehive.org

Creative Hive started in 2012 as a research project from the University of Salford to provide a web platform to allow staff, students and alumni from any University to be able to set up a blog and showcase of their work both on the web and in the virtual world of Second Life. It is thus a good examples of supporting integration of learning from below, enabling individual to reflect and showcase their achievements and share them. People sign up for Creative Hive for free and can then easily set up a blog, showcase of their work, slideshow and profile containing their information, images, videos and links. This material goes into their own web space and also a central, searchable pool of posts and projects which can be found over time. The posts also automatically feed into a special space in the virtual world of Second Life as a 3D virtual portfolio space

Creative Hive has been adopted by many students and organizations and is proving to be a valuable conduit between Universities and Industry encompassing every kind of creativity enabling cross pollination and cross disciplinary working.

8 INCLUSIVENESS

8.1 SOCIO-ECONOMIC IMPACT OF EDUCATION

Definition

The change required to ***renew the effectiveness of education and Lifelong Learning*** *as instruments of* ***social mobility, cohesiveness and inclusion*** *within European society*

Education needs to find new successful paradigms to maintain its effectiveness in promoting social mobility, cohesiveness and inclusion in front of the new challenges brought about by the knowledge society which inherently change the way and the channels through which education is expected to fulfill its social role.

Key trends and challenges

Ensure responsiveness of education to societal needs. In order to contribute to social development education needs to ensure responsiveness to local and global needs and make sure its learning provisions are aligned with the social, cultural and economic contexts where individuals participate and contribute. Dialogue and negotiation with local stakeholders – namely the productive system and the labor market – is gaining importance for the definition of up-to-date education models which can concretely contribute to innovation, employment and social advancement.

Ensuring universal access to QUALITY education. With respect to social effectiveness, access to education today is not enough to guarantee inclusion and social mobility. The Quality of Learning is paramount, especially within the advanced requirements of the knowledge society for autonomous individuals, active citizens and skillful workers. This includes overcoming any remaining digital divide – ensuring ICT infrastructure but also digital competences and information skills to build fully on the existing learning opportunities offered by ICT.

Ownership and managing of the individual learning patrimony. The knowledge society requires individuals to cope with continuous change and mobility. Today social effectiveness of education also deals with creating the best conditions for individuals to make the best out of their learning capital. The awareness of one's own learning capital turns into greater capacity to orient oneself within society and on the labor market – to propose oneself on the basis of potential contribution and value offered. Such awareness is favored by lifelong learning systems which validate and certify competences acquired and work well in enabling mobility in education and in the labor market, favoring transparency and match between demand and supply.

Countries and sectors

More than ever education is invested today with a key role for societal innovation and inclusion. How to guarantee its social effectiveness in the present crisis – and make it contribute to recovery - is however a concern of European countries. The crisis has exacerbated some existing failures of learning systems, making education more expensive for individuals but not necessarily able to guarantee employment and social mobility. On the other hand the sensitivity to the social impact of education varies significantly across learning sectors. While VET and Adult Education perceive themselves as inherently dedicated to social and economic inclusion, Higher Education has not been primarily focused on this objective. However, signs of change exist, with a new attention of higher education to lifelong learning and contribution to local development and social advancement, testified by initiatives such as the European Universities' charter on Lifelong learning[5] adopted by the Bologna process as well as the Allume project - run by several European

5 EUA (2008), European Universities Charter on Lifelong Learning

universities together with EUCEN - and producing instruments and recommendations to implement lifelong learning at higher education level[6].

Debate and practice

Despite rhetoric, budget cuts in many European countries show that in time of crisis education is often sacrificed in favor of more short-term goals. The debate is focusing on how to renew social effectiveness of education and make it a safety net for the individuals and for society, building tighter integration between education, society and work. However the changes required take time to be accepted and implemented and clash with the sense of emergency and unstable political will.

What can ICT do?

As already mentioned ICT can reduce unit costs of education on both the side of the individual and of learning offer, hereby supporting universal access to education.

The model proposed by Open Education places free-of-charge learning within the scope of the development of OER-specific policy and practices, including the development of quality assurance schemes able to grant the relevance and quality of both OER and the processes to produce and share them.
Furthermore ICT can help in developing solutions to better integrate the learning experiences of individual, including the informal one, turning it into spendable capital which can be used across the labor market.

6 ALLUME – From "A Lifelong Learning University Model for Europe" to "Pathways for Lifelong Learning Universities", 2009-2011, *http://allume.eucen.eu/*

Some examples from Europe

Upcaring – supporting inclusion and employability through recognition of learning

http://www.upcaring.eu/

UPcaring, UPgrading CAre service with INnovative skills certification, e-learning and matchinG system, is a European project funded by the Lifelong Learning programme of the European Commission which aims at offering home care workers (HCW) the opportunity to see their competences – however acquired - recognized and to improve their professionalism through an expressly designed e-learning system.

The project support the development and consolidation of "missing" competences through blended learning opportunities which can be selected à la carte. It furthermore include a model for improving the demand/supply matching system, based on an advanced use of proper ICTs and e-portfolio, will be available for public bodies in charge to be able to deliver adequate services to the families in need (who will be reassured of finding the adequate competences to meet their requirements), and to the workers (whose access to the labor market will be more prompt and smooth, will be able to update their cv autonomously or with the support of prepared intermediary professionals).

Blended learning master in Nursing and Widwifery at KU Leuven – supporting participation and overcoming the skills mismatch

KU Leuven launched in 2003 a project was launched to move the master in Nursing and Widwifery into a blended learning format to promote participation of working students, namely nurses and midwifes. At the basis of this initiative was the assumed added value of work- learning combination and the pressing shortage of midwifes and nurses on the Flemish labour market.

With its blended modality, the master allows now for more flexibility in time and space for the students to reach the learning goals. A wide range of technologies is used to support the learning from a distance: the blackboard based learning platform 'Toledo', weblectures, screencasting etc. Each technology is chosen in view of the learning goals and how the technology can support students in reaching these goals.

The project is also seen as an opportunity, not only to implement new technologies to support teaching methods, but also to review the full program and the different courses in terms of learning goals and efficiency.

9 TEACHING

9.1 TEACHERS COMPETENCIES AND COMMUNITIES OF PRACTICE

Definition

The change required in the ***competencies and, therefore, in the initial education and continuous professional development of teachers****, trainers and other facilitators of learning processes in order to help them play a pro-active role in the before mentioned required transformation of education and Lifelong Learning.*

With the focus of education shifting from knowledge to competences and an increasing attention on motivation and autonomy of learners as the key to lifelong learning, the role of teachers, trainers and other facilitators of learning process is expected to undergo reflection and change in order to match the desired objectives and support innovation of education system.

Key trends and challenges

Teachers as designers of the learning environment. With education increasing its focus on individual autonomy, meta-cognition and critical thinking, the role of teachers is expected to shift from transmitting knowledge to facilitating individual and reflective approaches to learning and knowledge building. Less standardization in teaching is required. Key teacher competences include the capacity to articulate the teaching/learning process in all its phases (identification of needs, design and implementation, evaluation) adapting it to individual and group needs.

The orchestrating role of teachers includes the definition of original and personalized learning contexts which respond to differentiated learning needs and paces and fully profit of the opportunities offered by ICT. Digital competences (and their continuous update) are obviously essential to make this possible and increasingly concern also the capacity to produce, share and remix (Open) Education Resources.

Increased focus on learning continuum (formal, non- formal, informal). The shift towards increased learner-centered approaches in education requires teacher to be able to fully build on and value the life-wide learning experience of students, being able to understand and master the continuum between learning contexts. The "playing field" of formal education - including school - is getting broader and requires teachers to develop competences to bridge the gap between the "in and out" of formal education.

Teacher collaborations and peer learning practices. Collaborative, informal and peer learning are increasingly widespread practices in the teaching community. ICT offers teachers the opportunity to share ideas and resources in social communities, find learning resources online as well as opportunities for their own professional development. Experimentations and innovations in teaching are already increasingly capitalized through teacher networking (either informal or more formally structured like eTwinning1 and this trends is expected to grow in the future, considering that future teachers will be digital natives.

Countries and sectors

The reality of teachers' education and in-service training is much differentiated across countries and lifelong learning sectors. Still in several systems, the only real requirement of teaching is a good knowledge of the subject to be taught, with little or no requirement of pedagogical, psychological and ICT competences. This situation is slowly changing and teachers' qualifications are slowly increasing. Much still remains to be done even in the most advanced countries. European and international qualification frameworks for teachers are emerging and may offer the opportunity to catch up for countries with less qualified teaching staff. However the financial crisis and the severe restrictions to public spending are challenging the increased awareness of re-qualification needs of teachers and trainers.

Debate and practice

Teacher education occupies a central place in the European debate; it is a widely shared belief that teachers play a key role in any innovation process which is likely to transform education. Their own attitudes and competences are thus key to leverage transformation, starting from their daily practice in the classroom to engender system change. Since the late 90s policy documents at the EU and national level as well as research projects have been preaching about the need to shift to a learner-centered model in education, where the teacher should play the role of mentor and orchestrator rather than pure transmitter of knowledge. However, the proposed reforms and attempts of change in this field reflect existing opposing views of education turning into highly different approaches which are often reversed by changes in political majority

In that respect - the already mentioned international competences framework for teachers and trainers – such as those promoted by UNESCO on ICT, the EU etc. – can support convergence towards a European approach to teacher competences, thus overcoming local political bottlenecks. In practice however, much in the desired shift depends on the own willingness and interest of teachers. As long as curricula and assessment methods are linked to an industrial model, it is hard to think about a mainstreaming trend and teachers being orchestrators risk to remain episodes and case studies of research papers and projects.

What can ICT do?

ICT can support professional development of teachers by favoring the acquisition and consolidation of the necessary digital competences on their part but above all by supporting community of practices and exchange among teachers. The example of eTwinning is a very significant illustration of how large numbers of teachers can be involved in relevant and recognized communities of practice.

In that respect OER (and specifically the various initiatives promoting these resources such as OpenScout[1], Open Course Ware - OCW[1], the Multimedia Educational Resources for Learning and Online Teaching - Merlot[1], Open Learning Initiative - OLI[1]) also offers teachers the possibility to be part of a large community of exchange and to produce, share, adapt and re-use learning resources available at local, national or global scale. The necessary cultural aptitude and competences need however to be developed on the part of teachers
The rise of peer learning and teacher networking favored by ICT are affecting traditional institution of teacher education and particularly continuous training, which has more difficulty in being constantly updated. These are likely to be increasingly complemented by horizontal and networked teacher learning practices, favoring reflective attitudes and personally defined improvement plan.

Some examples from Europe

Webinars for distance education tutors – Educating distance teachers in virtual classrooms

www.ils.de

ILS – a private Germane company – has started organizing Webinars to support distance education tutors all around Germany in their work with virtual classrooms. The aim of the webinars is in particular the development of online skills and pedagogical competences to work in "new virtual environments", including the organization of webinars itself. Getting used to virtual rooms also means getting prepared for the future and for international companies acting on globalized markets and/or subsidiaries in foreign countries

ForumLive – working together online to generate and share teaching material through ICT

http://www.forumlive.net

Forum live is a dynamic didactic platform for school teachers originated from a group of italian teachers who since 2005 acknowledged the strong need to work together, share material and experiences. Through a moodle platform teachers from different cities, school and grades can communicate using a forum and/or chat and upload files and create content and resources to be used in the classroom, using software such as Exelearning, Hot Potatoes, Photoshop, Flash, Wink, Movie Maker, Audacity, Didapages). In addition, some new teaching ways are suggested. two free online courses are offered to newcomers on how to use new technologies at school, namely the abovementioned software and start creating new teaching material to share with colleagues. This experience has proved to enhance teachers motivation and self-confidence and turned into a greater involvement of students with the learning experiences

10 QUALITY

10.1 QUALITY DEVELOPMENT AND ASSURANCE

Definition

The change required to ***continually optimize educational processes*** *so as to achieve maximum fitness for purpose, in the most efficient way possible, and simultaneously, independently check and verify (assure) these attributes so as to provide trust in the named processes.*

In an environment of constant iterative and disruptive change, quality processes are intended to act as a guarantee that such change happens for the better. However, quality is not an objective entity, and thus in an environment of accelerating change, which puts even higher demands on quality systems, the presumptions and methodologies of quality itself need to be reviewed and questioned, for it to continue serving its purpose.

Key trends and challenges

Changing norms and values in education. The traditional view of excellence from an educational management standpoint has long meant simply achieving the highest level of pure academic excellence. Today educational institutions are subject to a host of other demands. Amongst others, these include preparing graduates for the labor market, extending the reach of their programs to ever more students (from a social equity point of view), acting as active stakeholders within the community, and optimizing the resource efficiency of their processes. The comparative value of each of these attributes is still a question of substantial debate, the results of which are informing an evolving re-definition of the concept of a ”quality education system”.

New demands for increased objectivity. As part of the trend towards evidence-based policymaking, quality systems are increasingly expected to provide objective, measurable and comparable data, so as to provide definitive information as to which approaches and institutions are the most successful. A host of ranking tools, benchmarking indexes, scorecards and other similar quality tools are rushing to fill this demand, but up to this moment have proven woefully inadequate at accurately capturing the complexity of education systems, and as such continue to be an area of rapid innovation.

The threat of low-quality education. Online education vastly increases the scope for fraudsters to perpetuate education ‘scams’, offering fake and/or low quality qualifications. According to Accredibase, the number of diploma mills globally jumped 48% in a single year between 2010 and 2011. Nearly all of these were online offerings, and nearly all of them were ‘accredited’ by a quality assurance ‘agency’ which was itself a scam. Hence the need for ever-more reliable, transparent and globally trusted quality assurance ‘brands’.

Countries and sectors

The challenges faced by quality development and assurance systems vary widely between each learning sector, with each of them presenting unique issues to be addressed.

Schools are largely publicly managed, and curricula are in most countries managed/planned centrally by a government-appointed body. As such, the main quality challenges will focus around three questions: (i) is the content of curricula appropriately reflecting developments in learning and society?; (ii) How can new learning technologies be appropriately deployed to improve efficiency and effectiveness of teaching/learning?; (ii) How can quality systems be used to improve quality of individual teachers/schools?

Higher Education is a sector that is becoming increasingly diversified, with a multitude of providers and offerings, posing different questions such as: (i) How can one guarantee the (comparable) quality of awarded academic qualifications, amongst a sea of offerings? (ii) How does one evaluate and ensure the quality of intangible learning experiences such as peer-production, entrepreneurial spirit etc.?; (iii) What does quality mean in the context of Personal Learning Environments and flexible learning pathways?

For Learning at Work as well as non-formal and informal learning, the main question refers to whether quality assurance of outputs (in the form of competences) prove to be sufficient to determine process quality.

Debate and practice

Nearly every aspect of quality development and assurance is subject to continuous debate. The most critical of these is the discussion on which indicators should be included in any evaluation of quality and their relevant weight, as already discussed above. In addition, a debate is ongoing as to who should be the arbiters of quality. While in the past this was clearly the competence of specialized subject-matter experts, the benefitting of widening the circle and profile of peers contributing to quality review is becoming more recognized. In terms of quality tools and approaches a number of different models (such as process-models, defect-based models, peer-review based models etc) continue to tackle the issue from different perspectives, with each being supported by a lobby interested in gaining increased share for their model.

What can ICT do?

ICT has the potential to bring profound changes to every aspect of quality, and contributes to many of the challenges and tensions described above.

From a *content* perspective, ICT is changing is the relationship of information to data, and changing the methods by which we access, process and use knowledge. This in turn, means that the contents of learning must change to reflect these developments and that the conception of quality must evolve in line.

From a *method* perspective, ICT offers unparalleled tools for communication, transparency and openness. This allows for open-quality systems (such as crowd-sourced peer-review, quality through publication of processes and materials, etc) to evolve and thus expand the quality community beyond specialized quality reviewers.

From a *tools* perspective developments in the processing of big-data mean that unprecedented amounts of data are now available to researchers and quality professionals to derive ever-more objective connections between cause and effective in both pedagogy and educational management, although it should be stressed that this sector is still very much in its infancy.
From a *policy* perspective, technology allows for more testing, faster (sometimes real-time) results, and better traceability, allowing for policies to be tweaked and improved at regular intervals rather than necessitating long-term reviews.

Some examples from Europe

CEL - teChnology-Enhanced Learning accreditation

http://www.efmd.org/index.php/accreditation-main/cel

CEL is an accreditation for Technology Enhanced Programme in the field of Management education, jointly developed by the EFMD and the University of St Galen. It aims at providing a quality improvement system for educational providers and to identify the best programmes in the field. CEL has developed a new quality improvement tool specifically aimed to assess the added value brought by technology to the programme. Focus was thus put on the consistency between the content and the delivery mode promoting a creative use of technology in the programme value chain.

SEVAQ+ - Quality evaluation in TEL as a shared process

http://sevaq.efquel.org/

SEVAQ+ is a quality tool designed to be used by a range of learning organisations – professional training centers, in-company training departments or universities – to evaluate the quality of any teaching and learning supported by technology (including blended approaches). It provides instruments to design questionnaires adapted to one's own organization and learning experience, allowing to evaluate quality in a rigorous way though build from inside, aware and relevant to the specific context.

The tool is qualified as being a shared evaluation process, meaning that it is open to internal but also external quality process. SEVAQ+ does not refer to a specific educational model. It is applicable to different models. The evaluation model highlights the strengths and weaknesses, discrepancies and concordances in one's learning experience and the definition of areas of improvement. The SEVAQ+ approach is based on agreement and sharing.

11 LEARNING SPACES

11.1 LEARNING SPACES AND LEARNING COMMUNITIES

Definition

The change required in the way individuals are prepared for the "new Learning Space", meant as the setting where lifelong and life-wide learning experiences are hosted, incubated and facilitated, always in a way whereby to go over and above the traditional geographical space, location and distance and their capacity of education systems to deploy learning experiences which are taking place within Learning Communities in emerging Learning Spaces, as the means to reaching a competent responsiveness level.

One of the areas with the most significant impact of the ICT on people's way of living and working corresponds to the de facto formation of new ways of learning. We are experiencing a consistently and systematically change in the means and ways of creating, authoring, communicating and sharing information, stories and thoughts, concepts and hypotheses, whereby emerging context schemes, which are defined through the building of communities of interested or even committed members as well as through the emergence of augmented reality environments, are enhancing the notions of ***Learning Spaces*** and of ***Learning Communities***. These are coming together in a complementary way to describe, in a way that is understood by both the digital immigrants and the digital natives, the emerging (augmented) reality of the working and socializing environments (settings) in the societies of the 21st century, characterized by "augmented environments" (interoperable solutions and single-sign-on terminal interactive interfaces) and communities of citizens, netizens and finally learners (gathering around themes, concepts, collaborative processes and dialoguing scenarios).

Key trends and challenges

Increased self-identification of learning communities thanks to ICT. The advances in search technology, the standards' frameworks and the enhanced interoperabilities, together with the emerging personalization technologies and the intelligent single-sign-on interfaces, are all boosting the potential of self-identification of Learning Communities, coupled with the increasingly available practice of augmented-reality based applications in learning settings, which in their turn give existence to inter-changeable and smoothly interoperable Learning Spaces.

Interoperable communities reflecting and favoring individual complex learning identities and their development. The communities of citizens (users) are active and productive, in terms of intellectual production, thus providing learning experiences which are hosted and facilitated in one or even more Learning Spaces. This provides for collaborative, multicultural, multi-identity and multi-tasking processes, which are becoming more and more a common practice in socializing applications and informal learning. The professional development and on-the-job training areas are slowly but steadily following, as they are more and more consistently (and systemically) linked and enhanced by communities identified by collaborative, multi-cultural working environments.

Countries and sectors

As it has already been mentioned, augmented-reality learning supporting environments are gradually deployed in the informal and non-formal learning as well as the professional development and training arenas. A number of key sectors provide good practice cases of enhanced learning in communities supported by augmented reality environments: materials science, nanotechnology, biotechnology, environment and health sciences as well as the behavioral sciences. In addition, collaborative working and professional development environments with applications

for sharing information and building solutions are also deploying augmented-reality applications; these are increasingly used by communities of professionals, trainers and tutors etc.

Finally, it seems that in the cultures, regions and countries characterized by "regulated decentralization" in formal education, openness and significant interaction with informal learning environments are better suited and prepared to address the afore-mentioned challenge. In other words, these formal education systems are more efficiently (less costly) and more effectively (better results) deploying the application and practice of Learning Spaces, which facilitate the highly achievable work of Learning Communities. And thus, they are eventually more effective in responding to the radical changes in our societies, preparing our offspring accordingly.

Debate and practice

More pilots need to be deployed for all forms of learning with augmented-reality applications and more interoperable content and process handling. Also more user/learner management solutions need to be applied - in order to strengthen good practice and reach an advanced level of learning experiences - along with semantic web and intelligent pattern recognition applications and web-based services.

At the same time, debate, research and analysis in the fields of cognition, cognitive psychology, pedagogy and behavioral science, is becoming the right environment to nurture solutions and recommendations for more effective approaches and deployment path to enhance learning experiences in inter-changeable and smoothly inter-operable Learning Spaces.

What can ICT do?

The dual challenge which defines the emerging frontiers of the "fight" against unequal learning opportunities and diminishing social mobility, is related firstly to the preparedness of our education systems to equip our societies' offspring with the nuance and competences in order to socialize and work in the emerging multi-cultural, multi-identity and multi-tasking settings. Secondly, it has to do with the capacity of the education systems to deploy ICT-built applications offering Learning Spaces to mostly self-organized Learning Communities, in order to enrich the learning experiences in the formally defined learning structures and linking to (and being shared by) those in the informal learning and professional development settings.

In order to do the above, deployment needs to be based on (policies)based on holistic approaches, engaging both learners and tutors, giving them the possibility to jointly pilot solutions and create intellectually at all levels - institutional as well as grassroots. The less hierarchical and more sharing-supporting systems and applications should thus increasingly be embedded in these holistic approaches and joint initiatives.

Some examples from Europe

iLab Europe – virtual learning space to practice in engineering education

http://www.ilab-europe.net/

iLab Europe is an initiative of Carinthia Tech Institute which established a network of interconnected online remote labs to practice in in engineering education. Six partners in Europe are now sharing this learning space and work together on online experiments at distance, offering their students a virtual shared learning environment where to freely practice various scenarios in quick succession without the fear of actually damaging resources, which often hinders real-life practice. This 'safe' way of gaining practice also encourages initiative, experimentation and creativity as students do not have to face real-world practical restraints.

The software architecture used to maintain the lab sessions as well as scheduling service and experiment data storage is the iLab Shared Architecture (ISA), a software architecture developed by MIT that offers online laboratory developers and users a common framework for using and sharing online laboratories.

OpenLeer centrum – augmenting the learning space via an on-line platform

Group T is a university college in the Netherlands that teaches Dutch as a second language to mainly Erasmus students, PhD candidates at KU Leuven and employees of international companies in and around the city. As a tool for motivation and activation, an electronic learning environment was created and implemented to complement face-to-face lessons. Learners accessed the website to do exercises at their own pace followed by immediate feedback, practice their vocabulary, browse through grammatical topics and communicate with each other and their teachers on a forum. This on-line learning space reflected and augment the learning community of the language course, offering students further opportunities to practice and share at their own pace with no time/space constraint.

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ABOUT VISIR

The VISIR project started at the end of 2011, on the initiative of 8 European Networks, with the aim of developing a shared vision on how ICT may help making lifelong learning a reality for all based on real-life scenarios and insights. The use of ICT for learning in Europe is gaining ground, but to uncap its potential as a driver of change for our economies and societies, we need to move from fragmentation and piloting to articulation and system adoption. The use of ICT for learning in Europe is gaining ground, but to uncap its potential as a driver of change for our economies and societies, we need to move from fragmentation and piloting to articulation and system adoption.

ABSTRACT

This draft report summarizes VISIR activity of trends analysis and vision building carried out during the first year of the project by offering an analysis of ongoing evolution in the learning domain organized around the logics of ”domains of change”. The latter correspond to key areas of transformation which are critical to the evolution of education and training system in the future. In the vision building exercise, they act as the lenses through which change in education is understood - as the result of interplaying trends which are both exogenous and endogenous - as well as the guiding map to define a shared transformation agenda.