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DEVELOPING THE INDIVIDUAL, THE WORKER, THE CITIZEN. THE AIMS OF EDUCATION RE-VISITED IN THE INFORMATION SOCIETY: HOW CAN ICT HELP INNOVATION?

By Claudio Dondi

ABSTRACT

This paper addresses the issue of how ICT are producing an impact on education and training and how they can become a powerful instrument for value-oriented innovation rather than an force strength contributing to the transformation of education into a commodity in the globalised economy. An analysis of present social trends – the “broader picture” – is followed by a review of the three essential aims of education – building the individual, the worker and the citizen – in the information society. The main forces that are affecting education and learning systems are than analysed and the likely future scenarios identified. The contribution of ICT to the Lifelong Learning agenda is than discussed and the emergence of learning communities analysed. Finally the main domains of change in education and training are explored and exemplified and some conclusive remarks are proposed on how policy can support value-oriented innovation.

ACKNOWLEDGEMENTS

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1. THE BROADER PICTURE: THE NEW RISK SOCIETY

When considering the factors of change impacting Education and Training in the European Countries, some considerations of *macro trends* that concern the social environment as a whole are required.

The German sociologist Ulrich Beck in 1986 was among the first to clarify and synthesize in his book "Risk Society"¹, the social changes that were operating as new drivers of modernity, and developing in most Advanced Countries: the Industrial Society, with the new conditions it had set, was bringing its successor. Beck identified three main disruptions that were concerning risks, individualization and politics.

RISKS

The risks that he identified were no more the ones coming from Nature and the like, but those made possible by Human action and depending of men's responsibility. Chernobyl was Beck's reference at this time. Instead of being a help to limit natural risks, technical innovations were developing their own risks and threats. A new challenge for Society consisted therefore to protect their members from endogenous risks that development creates. In other words, Society needs to control itself to prevent the risks it generates, the Responsibility Principle had already been formulated by Hans Jonas in 1979.

INDIVIDUALIZATION

But Beck did not consider only the risks attached to innovations and technology developments. He considered as much the social risks that are attached to Individualization: a behavior supported by the Industrial Society for it was judged an inescapable component for Economic dynamism. Unfortunately this positive behavioural disposition has its dark face: all structures of social life are gradually ruined. Family, social class, professional position, etc., all the bases that allow someone to belong to a community are weakened. Finally, as a matter of fact, individuals are left alone, in a maximum risk situation, in front of non-transparent markets constraints, where their individualization much more translates in terms of standardization, mass products and services, than in terms of autonomy and self-development. Second new challenge for modern Society according Ulrich Beck: restore a social bound between the individuals and the Society in order to enable people to face personal risks.

TRADE-OFF BETWEEN POLITICAL AND NON POLITICAL ISSUE

The third disruption identified by Ulrich Beck concerns the trade-off between political and non political issues: things that were thought of a political nature are no longer considered as such and reciprocally arguments referring to non-political sphere of concerns are now becoming political. This political trade-off transmutes the role of the State that is weakened and can no longer maintain its "interventionistic" stance meanwhile technical and scientific sub-politics substitute to political institutions and decide orientations with no democratic or parliamentary process, thus evading from any political control.

¹ Ulrich Beck, Risikogesellschaft: Auf dem Weg in eine andere Moderne, Frankfurt, Surkamp, 1986

The picture drawn sixteen years ago by Ulrich Beck perfectly reflects what we have been experiencing as trends for nearly 20 years, certainly at different level of achievement in the different European Countries. Primacy of Economic concerns was the dominant interest and resulted in an over-radicalised neo-liberistic approach, hard to sell to European citizens, generally “dressed” in European constraints, and which jeopardized the Social Compromise.

Thousand of illustrations of how Beck’s vision was powerful can be given in all domains of experience. Since we are concerned here with Education and Training an example of such an over-radicalised neo-liberalistic approach can be taken in that field: in 1996, in an OECD Report, one could read that, as far as Education and Training were concerned, the role of Public Authorities solely consisted in ensuring access to learning to those people who will never form a profitable market and which exclusion from the rest of the Community will increase as long as other people will continue to progress². Having to reflect on the possibility of a two-speed society, experts of the OECD only aware of the economic costs were blind to the huge social and political costs that their choice could represent for the future. Recent reports of the OECD do no longer reflect such short-sighted positions.

Beck’s picture is certainly the best framework to analyse the present re-considerations of the dominant model that are taking place due to new families of resistance that are exerting their forces.

FIRST, THE ANTI-GLOBALISATION MOVEMENT

The international climate began to change with Seattle demonstrations where anti-globalisation movements materialized against the World Trade Organisation, mainly, the International Monetary Fund, the World Bank, and responsibilities attributed to these “Technical” Authorities. As written in Atelier’ Report to STOA³ comparable dissatisfactions are expressed vis-à-vis the European institutions: “Citizens around the world are becoming increasingly concerned about the way *accelerating processes of globalisation and technological innovation are leading to cultural homogenisation and immense concentrations of financial power. As the opportunity gap between the top and bottom 20% at every geographical scale widens, the message seems to be “learn English and buy a computer or you’re out”*”

In Europe, this concern takes a particular dimension given the richness of its cultural heritage and diversity: the first seems to become increasingly commercialised while the second lives under a growing threat. In this context, policy-makers are in a bind. On the one hand, liberalisation, privatisation and the deployment of the necessary infrastructures for the information society seem to be minimum requirements for at least survival in a competitive global economy. This is the approach that characterises most EU information society initiatives, from the Bangemann report to eEurope.

² *Adult Learning and Technology in OECD Countries*, OECD, 1996.

³ *Cultural Diversity and the Information Society, Policy Options and Technological Issues*, Jesse Marsh and alii, Atelier, June 14, 2001. Project No EP/IV/STOA/2000/13/02

On the other hand, by doing so, policy-makers appear to be just following the industrial interests that, in the view of many European citizens, are arrogantly threatening their cultural identity, if not their lives. This only adds to the growing lack of trust in European institutions, already challenged by issues such as depleted uranium, mad cow disease, and more subtle questions such as hygiene directives which make, say, local cheese-making traditions illegal.

Seattle in 1995 and all the demonstration that followed have shown that not all the citizens (be they from developed Countries or not) were happy with globalisation. It was for some a surprise to discover how many Non Governmental Organisations were protesting, in addition to the rest of their claims, against what was denounced as a “denial of democracy”. At least, although radical, procedures could be set to initiate negotiations and start a process where protesters could express. Certainly most of the initiatives were considered as manipulations rather than as sincere expressions of interest to overcome differences of understanding and to reach compromises acceptable to all parties (that is what a negotiation process aims at).

SECOND, THE SHOCK OF SEPTEMBER 11TH

Long has been said on how to interpret the attack of the Twin Towers and the announcement of an endless terrorism. Certainly we don't expect here to bring new views or analyses, since anything and the contrary of anything have been said. However for our concerns, we have to take into consideration such an event which deeply transform the international climate and change the way people are representing to themselves the world where they live.

September 11 revealed to the citizens of advanced Countries that in spite of their power and their wealth, their Countries and the entities to which they belong, could not impose to all other countries their values, their economic visions, their cultural preferences and their behavioural patterns. It becomes more clear for the European citizens that the so-called Advanced Countries to which they belong, are promoting a way of life and an economic system which is not generally applicable. This entails a schizophrenic situation for both the euphemised Developing Countries and for the growing proportion of relatively poor people in the wealthy areas. Potential enemies are outside and inside the house, and violence is no longer a risk but a certainty. We should remind the first word of the Author's preface of the first European manual for the classroom, that Comenius wrote: “Instruction is the means to expel rudeness”.

Meanwhile institutions have lost part of their legitimacy, values that were perceived as universal are now questioned, and the European citizens feel these values less legitimate and are doubting of what they have left their representative to do in their names. Cultural dominance is not unrelated to violence. Notions such as “futurity”, sustainable development will gain a greater signification to European citizens. The feeling of being responsible will develop and the control on delegation to representatives will be heavier.

2. THE AIMS OF EDUCATION AND TRAINING RE-VISITED

In the transition from the industrial to the knowledge society education is increasing its role from an ancillary service to a leading force of economic and social development. Traditionally the three main aims of education were to build disciplined individuals, competent workers and respectful citizens. This was perfectly suitable to classic industrial society, which reserved responsibility, creativity and political initiative to smoothly enlarging elites.

What sort of individuals, workers and citizens are needed in the knowledge society?

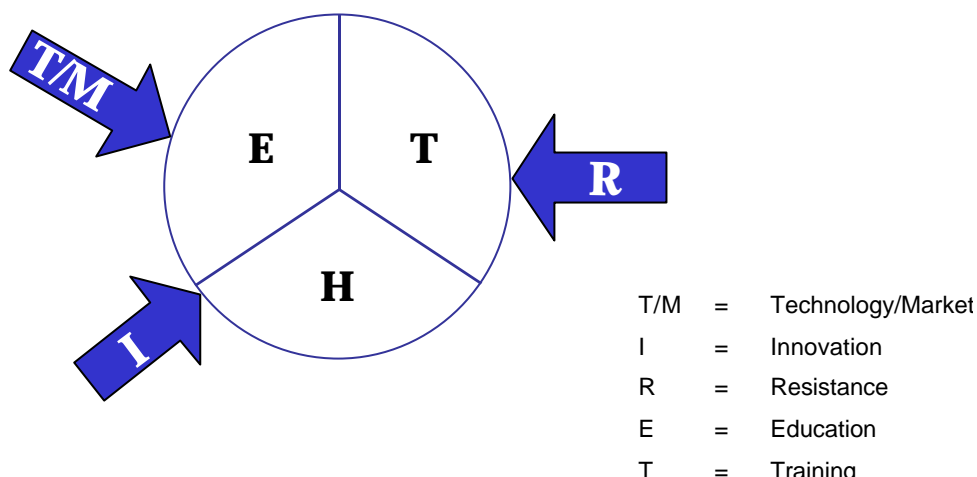
Several answers can be given to this question, but a large consensus exists, not only among educationalists, on the fact that autonomous individuals, entrepreneurial and creative workers, responsive and socially active citizens are by far preferable to the “versions” considered more popular in the industrial society. Innovation and creativity are now valued as keys for successful economic development, the real “wealth of nations” of the 21st century. However, several interpretations are possible of this evolution and the ways to determine change in education and training systems. In particular, the issue of ICT penetration within education and training is the “hot spot” of the debate on future scenarios for learning systems.

3. MAIN DRIVING FORCES OF CHANGE

On the basis of the analysis carried out in the L-CHANGE project – studying the change related to ICT occurring in learning systems - **three main directions of change**, sometimes converging and producing similar effects, and sometimes diverging, seems to emerge:

1. A push towards **de-institutionalisation** and “**marketisation**” of Education and Training, according to which an increased autonomy of learners to choose and buy among a vast plurality of learning opportunities is not supported and mediated very substantially by the conventional Education and Training organisations.
2. The second main direction of change is related to innovation processes taking place within or by initiative of Education and Training: the **lifelong learning** philosophy, including a higher degree of integration among the different subsystems of Education and Training, the autonomy of learners and the shift from teaching - based to learning - based approaches also thanks to ICT, the introduction of flexibility and quality elements based on a higher level of responsiveness to changes and needs of economy and society.

3. In addition to these two diverging forces of change, that have in common – among other things – an increased role of individual learners, we need to consider the tremendous **inertia strength** of Education and Training systems, which have very frequently absorbed some technological innovations in the past without substantially changing their way of working, so inhibiting both previously mentioned driving forces of change.



In general terms, a combination of these three forces is presently characterising Education and Training systems, but in each segment of Education and Training different evolution scenarios can take place, according to the “dominating” forces:

- ◆ In the School segment, the “**Inertia**” force seems to prevail in the majority of the countries analysed: although ICT has been introduced and integrated to different extents in primary and secondary schools, and although bottom-up networking and initiatives are growing, they still take the form of pilot experiences, and remain mostly isolated cases. The need for pedagogical innovation and for a shift from a teacher-centred to a learner-centred paradigm is universally recognised, as well as the high supporting potential that ICT could have in this shift. However, Information and communication technologies still remain mostly exploited in terms of information (and not of learning) delivery. Although the private sector is pushing towards de-institutionalisation, governments are strongly resisting to this force, by creating additional regulatory frameworks hindering the creation of new learning providers outside formal education settings. Thus, PPPs are fostered, but only to an extent which they remain public-controlled. The consequences for the enhancement of learners’ control and autonomy are more than visible, and can be exemplified by the “Danish paradox”, where if on one side ICT are fully integrated in learning and a number of virtual learning experiences are proliferating, a major interest and political goal remains the adoption of ICT within the current educational system with an almost maintained level of face-to-face contact between learners and learning providers.
- ◆ In **Higher education**, classic university paths leading to academic titles are likely to resist to innovation and defend their market position through their possibility to deliver official titles and

their direct access to public funding at national and regional level.⁴ However, Universities are showing more innovative trends than primary and secondary education, both in terms of virtual learning practice and delivery (eLearning and ODL Universities are growing both in Europe and in the US) and in terms of learners' autonomy and control enhancement. Links with the labour market are becoming tighter, and international networking (with educational institutions) and partnerships (with the private sector) are increasing, bringing to a new image of Universities as market actors. In the US, for instance, the New York University and the University of Columbia are delivering on-line courses to the corporate training sector. The stronger links between the academic and the labour world are fastening the process of innovation of universities, and at the same time enhancing a process of marketisation which will however not bring to de-institutionalisation in the next years.

- ◆ The **Learning and Skill sector** (including Vocational Education and Training and Corporate Training) turns out to be the most promising market segment for eLearning, as well as the one showing the most innovative trends: the need for flexible and autonomous workers is pushing ahead the concept of lifelong learning, as well as the need for integration between Education and Training systems.

This sector, which already shows innovative use of technologies in learning (enhancement of virtual learning and of virtual L2L and Learner-learning provider relationship), is now mostly concerned with the creation of new accreditation schemes, able to certify core skills and professional competencies acquired by the individual during his/her whole life. In Vocational education and Training, actions are mostly targeted to ICT integration in learning and pedagogical innovation, and refer mainly to the public sector. Continuous learning initiatives are growing, as witnessed by the increase of new learning centres and portals for adults (providing mainly ICT and language skills) and by programmes (such as the Italian IFTS) aimed at filling the competence and skills gap of (future) workers. Museums and libraries are increasingly offering resources and facilities for learning, as well as targeted educational initiatives, thereby enhancing their role of "informal learning providers". In corporate training, the need for cost effective and fast learning actions is making progress of ICT integration and full exploitation faster than in any other segment: the possibility of high investments (which is lacking in the education sector) as well as the need to train dislocated workers are bringing to a massive experimentation and use of eLearning, implying the creation of new learning tools and resources and a sound innovation in pedagogical terms.

- ◆ In the **informal learning sector**, that is not yet considered profitable by publishers and technology service providers, and has a tradition of community-based highly socializing learning, the scenario of Lifelong learning in place is likely to develop, according to the needs and preferences of adult learners who are not bound to curriculum obligations.

⁴ *EU policies and strategic change for eLearning in Universities*, Report of the project Higher education Consultation in technologies of information and Communications, HECTIC, Coimbra group of universities, December 2001.

- ◆ The **Home sector**, the **technology-market** force bringing to de-institutionalisation seems to prevail. The identification of eLearning as a likely area for quick market development is attracting more and more investors and major existing companies into the Education and Training areas, and the monopoly of formal education institutions is starting to be broken via the home sector: non-accredited eLearning courses and portals are growing over the Internet, and the edutainment market is considered by suppliers as the most promising sector (together with corporate training) of the eLearning market. The main risk consists in the lack of pedagogical services and support for home learners, since very often “content on line” is sold as eLearning to consumers unable to value the effectiveness of the learning delivered. The lack of world-recognised quality standards is thus enabling a process of marketisation, which hinders the full and real exploitation of ICT in learning.

4. LIFELONG LEARNING AND ICT CONTRIBUTION

The recent European “Memorandum on Lifelong Learning” constitutes a significant step in providing a view on the major changes that are affecting society at large and education and training systems in particular.

This section analyses in particular three aspects that are mentioned in the Memorandum:

- ◆ how motivation to learn is generated and maintained in an adult audience;
- ◆ how ICT changes and increases the potential of distance education to contribute to lifelong learning;
- ◆ how ICT, by changing distance learning, can become a key tool for the establishment of learning communities among adults.

ADULTS’ MOTIVATION TO LEARN AND LEARNING SYSTEM DESIGN

As the Memorandum well points out, lifelong learning is not just about a more integrated supply of education, training and learning opportunities: it is also – and maybe more importantly – about generating awareness and motivation to learn:

“People will only plan for consistent learning activities throughout their lives if they want to learn”

Among the factors that would discourage people to learn the Memorandum identifies the following;

- ◆ learning methods that remind unsuccessful previous learning experiences;
- ◆ limitations of access in terms of time, place and affordability;
- ◆ lack of recognition of cultural perspectives and life experience;

- ◆ lack of recognition of previous knowledge, skills and expertise.

If we translate the identification of these inhibiting factors into principles for action, the following could be the result:

1. offer and support learning experiences in which adult learners are stimulated to take an active role, to continuously check the relevance of what they are learning, to self-evaluate;
2. provide the opportunity to learn in a multiplicity of environments, with few or no time limitations, and at an affordable cost (not only the “price” but also the cost of time and transport required to take part in a learning programme);
3. adopt learning systems design methods that are able to build on cultural specificity and life experience, so letting individuals personalise their learning programme and bring their “added value” to the learning groups;
4. provide and support learning paths that do not oblige to go through already known and practised contents for the sake of a discipline structure, but rather are built on individual specific needs and requirements.

Although these four “design principles” may sound relatively obvious and theoretically accepted in 2001, they bring with them a revolution of education and training provision as we are used to conceive it. It is not just a problem of training teachers: teachers have to be given the time and tools to accept a radically new role in learning system. It is not just a problem of “packaging” learning contents and making them available to learners when and where they want: the quality of the learning experience must be designed.

It is not just a problem of letting adult present themselves and use their own expression style: adults’ potential to support peers or to bring new perspectives in a learning group must be considered and utilised as far as possible. It is not just a problem of “shortening” education and training provision according to previous knowledge, skills and expertise: learners must be individually helped to build a really meaningful and motivating learning path, corresponding to their needs and wishes.

THE CONTRIBUTION OF ICT TO DISTANCE EDUCATION AND FLEXIBLE LEARNING

Distance education has been “invented” to address the constraints of time and place that were preventing a large section of population to access formal education and training provision. Being substantially different from classroom teaching, it also resulted attractive to adult learners that had negative youth experiences in school and universities.

However, classic distance education, based on given curricula and on self-managed study with tutorial support, was not yet able to address the third and the fourth design principles identified above, and even on the first (different methods) distance education resulted successful only for learners who had enough self-discipline and perseverance to study alone for a long period.

In the 80's the concepts of open or flexible learning seemed to finally address the fourth design principle: individual learning paths, possible through a modularised provision of distance education (integrated sometimes with classroom or work-based sessions), combined standard quality of learning "components" (the learning modules) and tailor-made learning experience. Still, a weak point of open and/or flexible learning as we knew it was the relatively low level of interpersonal communication and the difficulty for learners to persevere in an individual learning experience.

The real "revolution" in open distance learning is in fact occurring thanks to ICT and specifically thanks to communication technology that allows distance learning to become much more a "community activity" than it used to be.

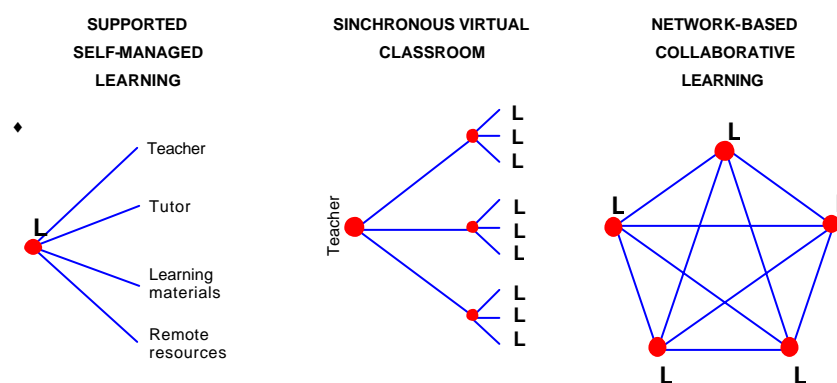
ICT AND NEW ODL SCENARIOS

The introduction of communication technology in education and training has produced great impact and modifications both in the way to design, manage and deliver ODL schemes (institutional point of view) and in the way to perceive, select, participate in and benefit from ODL schemes (end-user point of view). New technologies have overcome many boundaries (e.g. geographical, cultural, and time-related) and extended, to unimaginable levels, the possibility to access large amounts of resources in real time and to promote communication flows among different actors involved in the process.

Three ODL models have emerged from the broad diffusion of communication technology in recent years:

- ◆ supported self-managed learning;
- ◆ synchronous virtual classroom;
- ◆ networked collaborative learning.

These models have to be considered as a possible way to analyse the most recent approaches in the ODL field, not a way to directly classify concrete experiences. In this respect, it has to be underlined that the three models rarely occur in the "pure" form. The majority of experiences feature elements belonging to two or three of them.



CLASSIC ODL REVISITED: THE SUPPORTED SELF-MANAGED LEARNING

This model is based on a *learner centred* approach and is an evolution of classic distance education in which communication technology intervenes in a more systematic way to facilitate contacts with tutors and access to learning resources. The dominant paradigm is that of individual and differentiated learning. The learner follows a personalised training path having at his/her disposal different learning materials.

The tutor supports the learners during the whole course and especially in the definition of the training path and in the selection of the learning resources. This approach is often used either to acquire basic knowledge or to specialise teachers in a specific subject area, the content of which is consolidated and capitalised in learning materials.

ICT is often used for the transmission of the course contents or as a way to access resources (databases, articles, etc.) and as a channel of communication between the learner and the tutor. In some cases it also provides direct access to teachers and experts in the subject area that act as top-level content-oriented tutors.

TEACHING-BASED ODL: THE SYNCHRONOUS VIRTUAL CLASSROOMS

The virtual classroom model is based on a teacher centred approach. It consists of a face to face lesson implemented in an ODL context with the support of ICT: e.g. audio-video seminar, video lesson. The learners are part of a class in spite of their locations and their distance from the teachers. In this case an expert/teacher gives the lesson and the learners are in the position to ask questions and make comments. The interaction flow goes from teachers to learner and vice-versa. Also in this model the contents are related to specialised subject matter or basic content which needs to be transmitted to a large and spread out audience (e.g. overcrowded undergraduate first year courses). ICT provides the communication channel among teacher and learners during the training session. In some cases materials are delivered before the lesson in order to provide a common background but the majority of contents are directly provided by the teacher.

LEARNING ALMOST WITHOUT TEACHER: THE NETWORKED COLLABORATIVE LEARNING

Like the self-supported learning model, the collaborative model is as well based on a learner centred paradigm but it is the *group of learners* rather than the individual learner that characterises the approach. The community of learners is involved in the development or in the achievement of a common task. This model differs from the previous ones because the acquisition of new knowledge and the improvement of competencies are not due to self-study on a set of available learning resources (first model) or to the transmission of contents by a teacher (second model), but the learning process is generated by means of the inter-actions among all learners and the sharing of experiences and competencies already available among the learners-group. The creation of contents

is part of the process itself. A typical way of giving focus in collaborative learning is to refer to the representation of existing competencies among the collaborating learners and of new competencies developed through the exchange of experience related to different contexts.

This method would normally work best in a relatively homogeneous professional group: school teachers of the same discipline are one of the most frequent cases to suggest collaborative learning, but also teachers of different disciplines facing a common problem may constitute a good group. Collaborative distance learning gives trainees and teachers the opportunity to leave behind the traditional stand-alone position without having to find common space and time at the expense of professional and family duties.

This scenario can make things much easier for teachers and adult learners, may they be working in big schools of busy cities or small schools in distant isolated places. It brings together, in a virtual environment, persons who do not have to travel to that effect and who can meet at their own convenience whenever they have time and feel like doing it. This means that the work is basically group-centred, without major constraints concerning time, space and schedules, except for the cases in which real-time technologies are exploited. In this scenario the trainees support each other, but always having the opportunity to turn to the trainer(s) for special help.

Pedagogical Characteristics	Typical Technologies	Ways to Implement	Training Content	Skills Required from the Learner
<i>ODL paradigm: Supported self managed learning</i>				
<ul style="list-style-type: none"> ▪ Learner centred ▪ Knowledge enquired by the learner ▪ Support system 	<ul style="list-style-type: none"> ▪ Asynchronous technologies (e.g.: e-mail forum, HTTP, FTP) ▪ Off-line technologies (e.g.: audio/video cassette, CD-ROM) 	<ul style="list-style-type: none"> ▪ Modular course ▪ Individualised learning path ▪ Guidance and support by the tutor 	<ul style="list-style-type: none"> ▪ Stable contents ▪ Basic knowledge ▪ In-depth and specific contents 	<ul style="list-style-type: none"> ▪ Planning and control of the own learning process
<i>ODL paradigm: Synchronous virtual classroom</i>				
<ul style="list-style-type: none"> ▪ Teacher centred ▪ Questions by the learners 	<ul style="list-style-type: none"> ▪ Synchronous technologies (e.g. audio/video conference, chat) 	<ul style="list-style-type: none"> ▪ Knowledge transmitted by the teacher ▪ Integration with other active learning methodologies 	<ul style="list-style-type: none"> ▪ High added value from the content point of view (e.g. Excellent teacher) ▪ Support to the motivation development of positive attitude and behaviour 	<ul style="list-style-type: none"> ▪ Understanding and organisation of the "received" contents
<i>ODL paradigm: Networked collaborative learning</i>				
<ul style="list-style-type: none"> ▪ Group centred ▪ Dynamic communication between all points of the net (star communication) 	<ul style="list-style-type: none"> ▪ Synchronous technologies (e.g. audio/video conference, chat) ▪ Asynchronous technologies (e.g. e-mail, forum, HTTP, FTP) 	<ul style="list-style-type: none"> ▪ Communication flows: one to one, one to many, many to many ▪ Network animation 	<ul style="list-style-type: none"> ▪ Sharing of experience and know-how ▪ Possible common projects, project work ▪ Development of the group-competencies representation 	<ul style="list-style-type: none"> ▪ Representation and sharing of own and group competencies ▪ Skills design and planning, etc.

Table 1. Three models of ODL supported by communication technology

ICT AND LEARNING COMMUNITIES OF ADULTS

The previous paragraphs have tried to explain how much distance learning has increased its potential to support the European Lifelong Learning Agenda thanks to the widespread use of communication technology. Without denying the value of the revisited models based on individual learners and on virtual classroom – that can anyhow build the feeling of a learning community – it seems to us that the most promising area to be explored is networked collaborative learning among adults. Defining their collective agenda, presenting their learning interests and representing their knowledge, skills and experiences, learning from unexpected commonalities or differences in the context and approach of fellow learners, working together to produce common results, discussing evaluation approaches: all these activities, that can be organised among adult learners in different locations – with or without job related purpose – can really overcome the feeling of isolation that characterised classic distance learning and can generate solid motivation to learn by addressing all the four design principles identified at the beginning of this section.

Several experiences of successful and less successful collaborative learning supported by communication technology are available and studied in professional environments. They tell us that a good structuration and animation capacity is anyhow required to support the motivation of learners and the achievement of significant learning results, and that a working approach is to link learning activities, as much as possible, to concrete problems and situations in the work environment. If the collaborative learning model has to be applied to non-professional community -related learning activities, new levers to motivation have to be addressed, such as social awareness, citizenship building, cultural interest sharing, everyday life concerns. The challenge is there, for lifelong learning believers, to create and test virtual communities of adult learners.

5. THE MAIN DOMAINS OF CHANGE RELATED TO ICT

The L-CHANGE project has identified several domains of change – within education and training systems – related to ICT diffusion:

- ◆ Institutional context of learning;
- ◆ Organisation, market and distribution;
- ◆ Allocation of resources;
- ◆ Range and quality of provision;
- ◆ Access to learning;
- ◆ Learner-Provider and Learner-Learner relationship.

In this section a review of evidence collected by L-CHANGE in 2001 is provided in order to facilitate a reflection on how it is possible to influence a value-oriented innovation process in learning systems.

INSTITUTIONAL CONTEXT OF LEARNING

In general terms, changes in the institutional context of learning seem to be strictly linked to the level of ICT penetration (intended not only in terms of PC endowment, but also, and mostly, in terms of networking and broadband) and to the level of economic development. Evolution in **structural** terms seems to be faster in the Higher education and in the Corporate training sector, with main reference to large enterprises. Whereas in Southern European countries the creation of virtual learning environments in higher education is still characterised by “isolated” actions, in Denmark ICT is increasingly used for the delivery of learning in secondary schools (Virtual Gymnasium) and in some cases for examinations. In the UK, the creation of virtual learning environments in University is becoming a generalised trend.

In Italy, the Consorzio Nettuno is the most significant and representative example of Universities' commitment in innovation of the higher education system through the use of ODL and ICT : 38 Italian Universities are members of the Consortium, together with 28 technological centres., 285 courses are provided via satellite video (thanks to the partnership with Raisat), with a total of 16,000 hours of videoleasons and 12,000 hours of interactive exercises provided through Internet.

The penetration of PCs, Internet and Intranet in schools is increasing, but for the moment no major structural (logistic) changes are envisaged by policy makers. The school sector still seems to be strongly influenced, and stimulated by public policies: in Germany, as well as in the US, in Greece, in France and in Italy, public/private financed pilot projects and funding programmes are fostering the introduction and integration of ICT in schools (“No child left behind” initiative and “e-rate” fund programme in the US; Action Plan-PAGSI in France, PSTD Plan In Italy, Schulen ans Netz in Germany). The need for new roles and functions for teachers (implying pedagogical innovation) is set as one of the most strategic mid-term goals by all the remaining country governments' Information Society (IS) plans.

Lifelong learning is set as another key priority in the whole of IS plans of the countries analysed; taking different features according to the country analysed. In general terms, this is implying stronger links between **formal and informal learning** (rise of new public and private learning centres within and outside formal Education and Training institutions; ICT user licences such as ECDL; rise of virtual and multimedia libraries and museums, and, in the US, rise of the “home-schooling” phenomenon – 850,000 home schooling students in 1999). In France the most interesting public initiative is creation of the A.P.P. (Ateliers de Pédagogie Personnalisée), an open learning activity organised around a centre of pedagogical resources using varied supports (books, files, video, software, distance learning services...).

Networking and bottom up initiatives are growing all over Europe, with a substantial increase in national and international partnerships and networks (“Tool for knowledge sharing” in Denmark, promoting Intranet and world-wide cooperation among educational institutions; GUNet in Greece

gathering education, research and academic actors; in France one of the most important and successful project to mention, concerning higher education, involving public/private partnerships, are the Numerical Campuses. The Numerical Campuses are the results of a broad co-operation between French universities (almost 200 are involved in this mechanism), foreign universities (38 partnerships), but also the private companies and the associations (178 partnerships).

As witnessed by the Spanish case (where the Banco Santander together with the CSIC and the Ministry of Technology and Research has promoted the creation of a portal offering services to students from school to continuous education), EU countries are moving towards a general increase of intersectoral networking, trend which has now become a praxis in the US. The need to create integrated learning systems, guaranteeing a match between Education and Training offer (in terms of competencies and skills of students) and labour market demand is strong in all country. In Italy, for instance, IFTS (Istruzione e Formazione Tecnica Superiore –Higher Technical Vocational Education and Training), has been legally instituted in 1999 with the aim to promote integration among the School, University and Training systems and to foster synergies with the labour world by means of post-diploma courses . The IFTS courses have been conceived as continuous training measures accessible by citizens independently of their age and professional/learning paths and allowing them to enrich their competencies portfolio. The modularisation of the courses enables, at the end of each IFTS course, a certification of the acquired skills which should – in principle - be recognised at regional, national and European level.

ORGANISATION, MARKET AND DISTRIBUTION

Low transparency and low entry barriers are featuring the eLearning market all over the world, from the US to the EU. Measures undertaken to face these pitfall vary from country to country, but in general terms the **role of proximity services is increasing**, as well as the **variety and number of newcomers on the market**, thanks to the low barriers of entry. The increasing demand for proximity services such as mentoring, tutoring, tests, etc is creating new markets for new actors (for instance, in Germany some providers offer on-line services with pedagogical content for specifically addressed to the so-called “afternoon market”), as well as new market niches for producers already on the market (in Greece Internet providers are starting to offer added value information services).

In the US, the proliferation of newcomers and the exponential growth of on-line education providers not accredited by the formal system is one of the major concerns of the government. To this respect, the Greek Ministry of education is promoting the dissemination of educational software in schools only if certified by the Institute for education; in France since June 1999 it has been introduced the mark

"RIP" or "Recognized Product of Teaching Interest", to make the multimedia teaching products of quality recognised by their potential users.

At regional level, this is happening in Italy as well, where, in the Emilia Romagna Region, multimedia and learning training products must be certified by an ad-hoc commission (CERFAD), involving representatives of the region and experts. Quality and branding turn thus to be key factors for surviving on the market, as well as (mostly regarding quality) a major concern for Governments. In order to face increasing competition, **vertical and horizontal strategic alliances** are growing both at national and international level. Countries such as Denmark, Greece and Italy face serious problems in terms of exporting due to language barriers, and therefore specialise in niche market for exporting (for instance, Art subjects in Italy) and concentrate more on adaptation and localisation of imported content and software.

Public - private partnerships are also growing, mostly pushed by public actors (for instance, the "Curriculum on line" in the UK is a partnership involving the UK government, software producers and broadcasters to provide material for every curriculum subject; in France the operation "Louvre.edu", involving a partnership of the Ministry of Education and the Louvre, aims at setting up an offer of structured resources to the public school.

The model of this offer is the Louvre.edu site which guarantees a free access to museographic resources of reference to the whole of the educational establishments for one negotiated duration). The potential **role of educational providers as market actors** is starting to become visible: in the US Colleges and Universities such as the New York University and the Columbia University are targeting their distance learning courses to the corporate training. ODL and eLearning are increasingly introduced in the higher education and corporate sector, resulting in an exponential growth of availability of **Internet and Intranet based material**. In parallel, the fast changing needs of demand (with main reference to the corporate sector) is **decreasing the lifecycle of products** and causing the rise of "learning objects".

ALLOCATION OF RESOURCES

Two main trends can be identified: in countries such as Spain and Greece where ICT penetration is still a major concern, resources are allocated to increasing technological endowment, ranging from schools to public services, whereas the allocation of resources for the use of ICT in learning (involving pedagogical innovation and courses for learning providers) is set as a short/mid term goal. In countries such as Denmark, Germany and the US, although investment of ICT is continuing to grow, focus is set mainly on teachers' training on how to use ICT in learning (Pedagogical ICT driving licence in Denmark, eL3-eLearning and teaching- a web based training offer for teachers training them on the use of new media in 16 subjects- in Germany, TEACH - distance learning material for teachers - in the US).

A recent initiative announced by the Italian Ministry of Education foresees the allocation of **31 Mio Euro** for the delivery of eLearning to Italian teachers. In France, in order to introduce the ICT into the initial training of the teachers, an emergency plan for the IUFM (Institut Universitaire de Formation des Maîtres; University Institute of Masters Training), equipped with a budget of 9 Mio. Euros over two years (2000-2001) and the creation of 100 employment of young doctors of new technologies, was implemented. The role of guidance and support services is growing, with main reference to the training and higher education sectors (in Spain, Educared promoted by Telefonica and with the joint participation of the Ministry of Education, Culture and Sports, the regional ministries of the Autonomous Communities, Trade Unions, Entrepreneurs' Associations and the Students-Parents Associations and that aims to become the virtual space of reference for centres, professors, students and administrative staff providing information about universities, chats, job vacancies, counselling-guidance and tele-training; in the US corporate training is increasingly outsourced to Universities). Major concerns of EU and US governments regard the issues of **ICT skill gap** (which has caused serious damages to the world economy in the last years) and the creation of shared and recognised **quality and copyright standards**.

RANGE AND QUALITY OF PROVISION

Range of provision is increasing, whereas the quality problem remains a big issue as stated in previous analysis. In Denmark, emphasis is set on innovative ICT-based learning materials. The same is true in UK, where the increasing availability of communication facilities (through mobile and interactive digital TV -iDTV) are believed to improve learning delivery in the future. In the US, publishers such as Mc Graw Hill and Pearson are offering **new learning materials** such as interactive versions of text books and on web-based educational tools for teachers and students.

The "Harvard Management Mentor" is a **support service** offered on-line by Harvard University to managers in order to help them solve critical situations and evaluate their skills. **Technological solutions** are increasingly **covering back office functions** both in the administrative offices of educational institutions and in public services, to an extent which mainly depends on the level of IT penetration of the country.

ACCESS TO LEARNING

Flexibility in time, space, tools and content is growing mainly in Northern European countries and in Germany with main reference to lifelong learning and higher education. The **Digital Divide** issue is a major concern for all governments, particularly in the US, where the Star School program, active since 1988, provides funding for infrastructure and educational delivery to disadvantaged groups.

Apart from the UK, Scandinavia and Germany, EU countries are still undergoing a piloting phase in terms of **use of new tools and resources** and consequently in terms of **flexibility of learning habits, styles and cultures**. In Germany, the “Lifelong learning for all” initiative explicitly encourages new cultures for teaching and learning. In other countries, IS Plans make reference to the need to change Education and Training in organisational and pedagogic terms, often making explicit reference to the issue of flexibility, intended both in terms of learning delivery and in terms of personal necessary core skills.

LEARNER-PROVIDER AND LEARNER-LEARNER RELATIONSHIP

The need for a pedagogical innovation explicated in the majority of the government plans is turning into reality only in a few countries: in Denmark, the Pedagogical ICT Driving Licence is supporting teachers in using ICT and in understanding their new role in the learning process; in the US new models of teaching and teachers’ training are promoted by the federal Government. The UK as well shows significant innovation elements, with special reference to higher education. As for other countries, the process of innovation is still slow, and represents a hindering factor to the exploitation of ICT potential in learning.

Re-orientation of learning providers is currently being planned in all the analysed countries, and new competence models for teachers seem to be necessary to move to a “learner-centred” paradigm in education. Apart from some exceptions in the higher Education and Training sectors, we cannot say that **face-to face communication** is decreasing: in Denmark, virtual interaction among learners and providers is mainly featuring pilot actions, but the main goals remains to maintain face to face contact between learners and teachers.

New competencies and skills are implying the need for new accreditation schemes: in Italy, the “Integrated Training System” (Sistema Formativo Integrato), agreed by the government and trade unions in 1999 (Patto Sociale per lo Sviluppo e l’Occupazione), foresees integrated training offer linking educational and (vocational and continuous) training paths of individuals.

Autonomy and control of learners are increasing mainly in the corporate sector and in higher education: in Germany, the ‘Virtuelle Hochschule Bayern (VHB)’ (i.e. ‘Bavarian Virtual University’), founded in 2000, is a network including all Bavarian Universities and polytechnics, with the aim to build up a system of study offers, which give the possibility to graduate in a widely virtual way.

As concerns the **interaction among learners**, in UK colleges and universities there is a growing potential for “forms of **real time group interaction** for revision or problem solving”. In other EU countries virtual interaction among learners is becoming a practice mainly in the corporate and in the informal learning segments: in Germany, VHS Virtuell “Virtual adult education centre” is an initiative among 15 educational centres, which offer a learning platform to attend courses at home. The students can choose between on-line seminars with classical teachers, training modules for self-

manage learning and, communities and forums. In general terms, whereas a common understanding is shared by researchers on the need to **shift to virtual collaborative learning environments**, the real shift is slowly happening, and for the moment it mainly concerns the corporate and the higher education segments. In informal and home learning, on the other side, virtual interaction is increasing, but it is still mainly focus on exchange of information, rather than on authentic collaborative learning processes.

6. CONCLUSIONS

The present debate is no longer about the opportunity to use ICT within learning systems, it is now about **how** to use it and, maybe more importantly, **how to give a sense to its use** that is coherent with the vision of the world belonging to a certain community – national, professional, organisational, etc.-.

In fact “the global and homogenising forces of the information society lead to an increased need for anchoring in communities. Care must be taken that this process does not lead to isolation. It is therefore important to promote openness and networking between communities”.⁵

Whilst it is broadly recognised that IT literacy is an important objective, higher priority should be given to **cultural literacy** – meaning “the ability to critically relate to other cultures” – to avoid a technology – based approach limited to connectivity and computer training, insufficient to reach communicational capability.

“Cultural diversity – in Europe and beyond – should not be seen as an obstacle to Information Society development, rather a complexity dimension that can counter-balance homogenising strengths of key business drivers⁶” and provide a focus for bottom-up democratic participation processes in the definition, implementation and evaluation of Information Society Agenda.

ICT within learning systems may facilitate community building, if sufficient awareness is developed among learners, teachers, policy makers on this potential.

Linking ICT diffusion and “adoption” to the development of this awareness is probably the biggest challenge to make eLearning a tool of new strategies for democratic participation and social inclusion combined with the need – for education – to support sustainable economic development.

⁵ STOA Panel, Cultural Diversity and the Information Society – Policy Options and Technological Issues, Brussels, July 2001.

⁶ STOA, *ibidem*.

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