Understanding Change, Adapting to Change, Shaping the Future

Change Drivers, Trends & Core Tensions for European Learning Systems & Educational Policies

LEONIE

Learning in **E**urope: **O**bservatory on **N**ational and **I**nternational **E**volution

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EXECUTIVE SUMMARY

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Are European Education and Training systems leading the way towards the knowledge society or just trying to adapt to the short-term economic agenda? Are they expanding their role from an ancillary service to a leading force of economic and social development?

LEONIE - Learning In Europe, Observatory on National and International Evolution, co-funded by the Socrates programme, Action 6.1 'General activities of observation and analysis', intends to tackle these fundamental questions by monitoring change processes in European learning systems and to stimulate proactive and transformative approaches to change.

In order to achieve these objectives, LEONIE has conducted two parallel surveys, inspired by an innovative combination of quanti-qualitative approaches: a Weak Signal Survey addressed to European stakeholders and a Delphi Survey addressed to experts on European education and training.

The following table summarise the main features of those surveys.

Table 1: Main Features of the Delphi & Weak Signals Surveys

Type of Survey / Main Features	Delphi Survey	Weak Signal Survey
Target Groups	E&T knowledgeable experts in Europe	E&T Stakeholders (students, parents, researchers, teachers…)
Objective	Forecast, consensus building on trends of change and policies	Acquiring divergent/creative signals/views
Methodology	Three-round consensus building process quanti-qualitiative carried out on line	Anonymous quanti-qualitiative online survey based on the weak-signals theory
Results	Set of trends and change likely to affect learning systems from inside and outside, set of policies related to these trends considered likely/appropriate	Set of strong, rather strong and weak or divergent signals: narrations of future learning

The Weak Signal Survey, addressed to E&T stakeholders, collected expectations or 'signals' of future developments. The emerging scenario, according to the Weak signal survey results, is that education and training will be increasingly based on online delivery. Face to face delivery mode will be used to complement e-Learning, to satisfy the needs of individual learners, their learning styles as well needs arising from instructional design. Learners will be able to choose from a variety of delivery modes/tools/resources/ways of learning.

The use of new technologies is influencing the process of teaching/learning by enabling new approaches, creating new models and innovative tools. Individual learners will take greater responsibility of their own development, self-training will become more common. A teacher's role as a facilitator/enabler will become more prominent. Knowledge sharing will be more interactive between learners and tutors, and between learners. Collaborative learning will become standard, both face-to-face and through video, in national and international contexts.

Education and training will be more flexible and tailored according to learners' needs. Problem-solving scenarios, group activities and simulations will replace lectures. There will be more networks between institutions making it possible for a student to compile his/her education by choosing different modules from different providers.

The student-centred approach and the overwhelming information flood both mean that learners need to become more critical.

New school subjects will be developed to enhance digital literacy and **personal organisation of knowledge**. Lots of fragmented facts are available, and therefore people should have the preparedness to understand the world as an entity and to draw conclusions.

Interactive training will make **education more fun.** Examples like 'flight simulation', 'patient simulation' and 'company simulation' allow to make mistakes without serious consequences (safe failure).

In the future, **training and learning** will increasingly become a **business activity**, following the business models describing them as knowledge-based services. A global market for learning supplies will be created to fulfil these needs. The value of traditional diplomas will decrease, as companies need 'doers' instead of diplomas. Paying clients will no longer accept low-quality education.

Learning and work will continue to integrate. New ways for performance support at knowledge intensive work are developed to enhance learning on-demand. The importance of informal learning will increase, because the traditional way of teaching cannot be effective enough to provide learners with practical skills and knowledge. Learning will become more and more just-in-time learning.

Innovations will be fostered by collaboration, ability to learn from each other and to relate theory with practice. Effective knowledge creation processes will emphasize systematic knowledge sharing and codification of tacit knowledge to the benefit of the organization. A culture of openness, trust, and commitment are the cornerstones of this knowledge sharing process.

The easy access to information has potential to improve the life standards everywhere in the world, but there exists also a risk that while **privileged learners will continue to gain easiest access** to learning, the **unprivileged ones will be loosing the battle of education and employability** in fast-growing paces. A sudden leap towards self-directed learning styles will leave a mass of people without any possibilities of achieving skills. It may also be that in the future, the few control the world, and the majority has no power.

There is a tendency to shift education, an area historically under the control of the individual states/nations, towards the creation of a **global education sphere**. Science has always been international, while education has remained national. In the future, the content of education and training will be internationalised. As companies do business more internationally it also requires education to be oriented this way (curriculum design).

Governments' and industry's influence in the provision of education and training will continue to increase, while education professionals' role in the process is decreasing. This is likely to result in **greater variation in quality of education and training.**

Those signals that received rather high average relevance value in the assessment process, while the deviation of opinions on the relevance also remained high, fall in the category of **weak signals**. Several of them describe bold scenarios in which e.g. catastrophes or recessions will result in education and training becoming a low priority in societies. Similar developments could strengthen the role of corporative universities while public education systems would suffer from lack of resources. This could further enhance unwanted depersonalization of education and training. Virtual worlds and gaming promote a culture where individuals have multiple identities. The true impact of such development on working life, education and training remains yet to be seen and could bear unforeseeable risks. Increased fragmentation and specialization in science was also recognized as a threat to education and training systems.

The radicalism of certain results emerging from the weak signal survey have been balanced by the **Delphi Survey**, addressed to E&T knowledgeable experts in Europe, and based on a consensus building process.

In this survey respondents were required to rate, on a scale of one to seven, the influence of several trends of change, both endogenous and exogenous, in shaping the European education and training systems over the next 10 years.

The second part of the questionnaire dealt with policies intended to influence education and training over the next 10 years. Respondents were invited to read a list of policies intended to cope with the changing learning system in Europe and to spur its developments. In this respect, respondents were requested to indicate, for each of the policies proposed:

a) To what extent they consider them likely to be implemented over the next 10 years by the EU and the member states?

b) To what extent they consider them appropriate for the positive development of the European learning systems over the next 10 years?

The main results of the **Delphi Survey** are summarised below:

● The scenario emerging from the answers of the experts, although not definable in an **univocal** way, is one in which European education and training will become more and more plural in a society more and more plural, more attentive to individual needs, and therefore reflecting the diversification of learning and living patterns in Europe, more open to cross-cultural/national initiatives and, finally, more and more evolving in accordance with economic macro-trends such as the rise of the knowledge economy, the internationalisation of exchanges and flexibility of companies and individuals. This last development might also imply the massive entry of market paradigms into E&T, according to respondents.

● In many respects, the results of the second part of the questionnaire (i.e. the one referring to policies) **corroborate** the ones of the first part (referring to trends), an example of it being the high importance attributed to information technologies within and outside education and training, with relevant implications for the policies to be implemented by decision-makers (stimulate the use of ICT for learning, broadening access etc).

● The issue of contextualising trends on a specific time-scale or in a defined spatial context (a country, a region) or even in a certain segment of European learning systems (education, training, and, at a further level of granularity, higher education, corporate training etc) is fundamental. The experts seem to point out that one size fits all hypotheses are not appropriate for tackling a complex issue such as the future evolution of education and training in Europe. Different trends in different countries are taking place at different speeds and at different institutional levels: the considerable differentiation of European learning systems will continue to exist and produce differentiated scenarios in spite of the recognised validity of identified trends across counties and sub-sectors.

● Nevertheless, political initiatives aimed at spurring the developments of European E&T in the same directions are considered moderately likely and appropriate, as the outcomes of the second part of the questionnaire show. On the other hand, the experts are somehow cautious in attributing high levels of likelihood to policies, in an economic conjuncture in which the average level of public expenditure into education and training is decreasing in several countries.

The study results of the Delphi and Weak signal surveys were presented in **eight national seminars** to validate their outcomes in the light of national and sectional specificities and in an international final conference. Overall, the validation and enrichment of results through surveys and seminars/conferences has involved more than 2,000 education and training experts and stakeholders.

A large number of active and committed participants and speakers drew a variegated picture of the complex situation in education and training across Europe in consideration of two core questions raised by LEONIE: "Which trends identified by LEONIE on the European level exist in your country?" and "Are there other trends in your country?" As a result, most of the trends discovered by the surveys LEONIE carried out exist in the eight participating countries – according to the national validation seminars – too.

Trends affecting European E&T

ICT: Access to infrastructures and the effective use converging media. This is in general the dominant trend in European E&T. In the course of the validation seminars, the gap between the provided hardware and the available e-Learning software was criticised: schools and other E&T institutions are equipped quite well with ICT in the meantime, but most of the products and programs obtained by these institutions are of very poor quality. It was stated that the development of e-Learning software is

still in its infancy and the deployment of valuable pedagogical tools is still to come. Only a sensible integration of e-Learning and traditional forms of learning could accomplish an enriched personal didactical setting in order to draw benefits from technology.

Quality of education: The push towards evaluation was considered controversial regarding the raise of quality in E&T – another strong trend affecting European E&T. Finnish experts mentioned e.g. that basic education is in crisis as they observed a loss of resources earmarked to it. The shift of resources from basic education to adult education was perceived as very problematic, resulting in expensive adult education, e.g. employment training. Romanian E&T experts on the other hand observed a potential decrease of the quality of higher education provision, assumedly deriving from a decreased quality of primary and secondary education provision. In contrast, Spanish E&T expressed their opinion that in the future not so much initial vocational training will be needed. In their view, a good secondary education and a good occupational training are sufficient for the majority of employments and jobs.

Lifelong Learning: The seminar attendees noticed a general resistance against the concept of Lifelong Learning across Europe. A holistic concept like LLL would require a rather dramatic change in the structure of educational systems. But this is not in sight even despite of ambitious reform projects, which are to be implemented all over European countries. On the one hand, the inertia of E&T institutions must be overcome by structural change towards system unification and simplification. A crucial point on the other hand is the willingness of the people to promote their careers permanently. This could be achieved by supplying as many people as possible with higher education, because well-educated people are more likely to study further.

Of course, several national peculiarities in the characteristics of the trends and drivers affecting the national E&T systems emerged during the panel sessions. In the following, some of these specific trends, which are strong in particular countries or regions and not so influential in others, are discussed.

A push towards regionalisation is a particularly big topic in Hungary and Spain; the latter is facing serious problems regarding migration. Participants of the Spanish seminar pointed out those social phenomena, not just economic ones are decisive for the further development of E&T. So they criticised the strong economic orientation of European E&T systems. The importance of the link between culture and education, school and society was also stressed in other seminars.

At the Finnish seminar, issues of security, safety and privacy were brought up deriving from uncertainty as a prevailing phenomenon in society. In light of risks arising from international terrorism and social exclusion the following questions were raised: Is teaching safe anymore? Are schools safe anymore? And – as an advanced e-Learning nation, a lot of teaching and learning is taking place over the Internet in Finland. Protection of privacy in these online learning systems was seen as an important issue that has not been adequately addressed.

The participating Eastern European countries (Hungary, Romania) are confronted especially with problems caused by fast changes due to transition and modernisation processes: polarisation of income, reduction in welfare provision, limited access to ICT infrastructure; in Hungary, learning has remained a strong functional activity in people's lives, since promises about long leisure times have not materialized yet. So there is no growing leisure time learning activity and joy of learning – which is very important for accomplishing the concept of LLL – as an emerging lifestyle is out of sight.

Policies shaping the future of European E&T

One outcome of the national seminars was the general agreement that there is still margin to shape the future of European E&T. But there are many difficulties in introducing changes in the national educational systems in order to establish a European dimension in E&T. In many countries and regions, there is an inertia and slowness of national educational systems in assimilating innovation and change and there might be a significant loss in public authority and power to shape the future of E&T. It was noted at the Finnish validation seminar that market forces have an increasing impact on how the education and training system is evolving, while the role of the Ministry of Education in the process is diminishing.

The German Federal system impedes change and the establishment of even a national notion of education because the

Federal Ministry of Education and Research has only few possibilities of action since the policies applied depend on the regional governments. As a consequence, one certain policy can be present in one federated state while others follow different paths. One of the possibilities for exercising influence is by means of funds if a proposed policy has a financial background: the Federal Ministry offers funds and the federated states can apply for them.

For the interpretation of the European results of LEONIE the specific context of the participating countries was regarded as highly important because the interpretation has to bear reference to the 'big topics' prevailing in each country. But also the professional statues of the LEONIE respondents as well as seminar attendees seem to be crucial. The tenor at the seminars was that these special national circumstances would lead to biased results, so it would not be possible to raise the LEONIE outcomes on an abstract European level.

Of course, this was the whole purpose of the national seminars and as it is shown above, this undertaking was successful in many respects. The feedback from the seminar attendees was extremely positive during and even after the seminars. According to the national Validation report of Romania, the LEONIE project even stimulated a permanent observatory regarding the trends and policies of the Romanian E&T system on the national level.

There was an explicit consent on the critical endeavour of the LEONIE project, which stimulated an urgently needed discussion process about crucial issues in education and training not just on a regional and national level but lifted it on a European level. After all, the meetings were welcomed occasions for the participants to meet and exchange ideas and views regarding the trends and policies determining national and European educational systems. Moreover, there was an agreement that the developments in other European countries could provide helpful suggestions for national reforms.

It is characteristic that in different European countries and regions different trends are taking place at different paces and at different institutional levels. European policies have to cope with all these regional peculiarities and differences in social and cultural perspectives, which are so important in the field of education. However, in a globalising and highly interdependent world no country is on its own so European nations have the underlying trends and development directions in common.

The future of E&T in times of fast and hectic changes is a delicate issue. Requisites are increasing according to evaluation, but it is even getting harder just to figure out what is really going on due to the complexity of E&T systems and their diverse interrelation to various economic, social and cultural phenomena. Moreover, the picture of the reality obtained by evaluation and analyses is always a mere part of reality and therefore quite vague. Despite all difficulties, LEONIE has achieved substantial steps in establishing an increased awareness for consolidating the European dimension in education and training.

Relying on the research carried out, the Leonie consortium has been able to spot those issues considered as fundamental by respondents in the form of core **tensions** for the future of learning systems. These tensions are:
1. Convergence vs. Context;
2. Continuity vs. Experimentalism;
3. Access vs. Excellence (Quantity vs. Quality);
4. Market Dynamics vs. Public Good Values;
5. Generalisation vs. Specialisation;
6. Information vs. Knowledge;
7. Individualisation vs. Socialisation of Learning;
8. Encouraging Traditional Providers vs. Bringing New Actors to drive Innovation in E&T;
9. More Investment vs. More Efficiency;
10. Focus on Young People vs. Re-directing Resources to Adult Learners.

The identification of tensions or 'critical uncertainties', might serve manifold purposes:
- Spur educational research, in line with the activity of broadly acknowledged international observatories of education such as OECD, which has also identified core dilemmas in its research activity on education;

- Reducing the complexity of multi-faceted evolutions while avoiding simplistic and unidirectional visions of the future;
- Providing a platform for debates among stakeholders which are often characterized by conflicting interests;
- Encouraging individuals and organizations to position themselves with regard to core issues for the future and develop a predictive capacity and a transformative approach; the following chapters of this report will elaborate more on this issue.

Furthermore, framing future development in the form of policy tensions has allowed the LEONIE consortium to structure along these lines a list of possible **indicators** to monitor change processes into education and training.

The LEONIE consortium has also identified several **levels of use** of its results and findings, in particular when it comes to the list of trends of change, policies and the tensions identified. The core tensions model can be used in order to:

Analyse one's own context and position

The list of identified trends and policies could be developed into useful supporting tools for conferences and seminars on the future of education and training systems. Such tools provide a valuable framework for analysing the changes in a specific country or sector and for understanding the potential impact of various trends and policies in a particular context. This became evident in the course of the national workshops when opening a structured dialogue on the future of education and training systems.

Analyse and assess past and present policies according to the set of tensions identified

Policy makers at European and national levels could assess policy aims/strategies against the tensions they identify. In this way policy makers could:

1. Achieve a better understanding of the trade-offs and the balances of forces that every political initiative directed towards E&T systems implies;
2. Develop general policy aims into specific objectives by responding to the following question: how could each term of the relevant tensions be dealt with in the framework of the policy aim proposed?
3. Since every tension is associated to indicators, policy makers could be in a position to assess the potential impact of their aims/strategy on fundamental dimensions such as the promotion of access/excellence, young/adult education etc.

Articulate the political debate

As an example of possible use, the debate on policies for education and training can be structured around the tensions model.

Building scenarios

Another example of the application of the tensions models is scenario building. A scenario matrix based on two of the identified tensions (access vs. excellence and convergence vs. context), has been elaborated. Prototype scenarios have been conceived in this way. These are called:

1. 'Mc-learn': the learning supermarket;
2. 'Civitas': learning citizenship;
3. 'Ask the Wizard': Professional learning communities;
4. 'Knowledge valley': Global networked centres of excellences.

Nevertheless, two limitations must be made explicit:

- The four resulting scenarios are obviously 'extreme' situations that would apply only when no counter trends to the generating ones would exist;
- Since the two poles of a tension are not necessarily opposite, the 'real scenarios' would rather need to be built upon original combinations of the poles of the tensions rather then combining two poles of different tensions.

Planning influence on the future

It is a strong belief among the partners that education and training should play a pivotal role in shaping the future of Europe and

that the LEONIE results could offer a logical and methodological framework useful for those stakeholders who wish to take a proactive approach.

The reactions of most of the participants of the LEONIE final conference, national seminars and research activities, (more than 2000 people) have been extremely encouraging. This is why the LEONIE partnership, even beyond the end of the project in April 2005, intends to keep consulting policy makers, researchers, experts, but also practitioners and other stakeholders on the future of European education and training systems and publicize the results of this ongoing exercise.

Furthermore, LEONIE foresees the collaboration with existing observatories (UNESCO, OECD, eLIG, EUROSTAT, CEDEFOP, EUN, HELIOS…) and other institutions as another field of possible productive activity where the LEONIE methodology and results can contribute to a better understanding and evaluation of ongoing and future analysis of learning systems. The ongoing research activities and the synergies with existing observatories will also lead to the organisation of joint seminars and conferences on the future of education and training in Europe and worldwide.

Through the organisation of such events, the LEONIE consortium intends to promote informal discussion and networking arenas on the future of education and training in Europe and worldwide, thus establishing a basis for a **European wide dialogue** on the future of education and training out of the official 'representative tables'.

This is to be intended as an on-going process, which could be continued through the establishment, consolidation and animation of a **forum evolving towards a 'laboratory', or a community of practice** motivated to enhance and give to European lifelong learning its rightful place in the knowledge society and build consensus on proposals and initiatives aimed at achieving this goal.

Finally, an **action plan** on the future of LEONIE should include the following issues:

- Carrying on research and dialogue in order to deepen and widen observation activities on change into European learning systems;
- Multiplying the discussion arenas on education and training;
- Building on the LEONIE results so as to stimulate proactive and transformative approaches to change;
- Using the LEONIE results and thus achieving a critical mass of consensus so as to make it self-sustainable;
- Identify relevant implications for policy and practice.

The most important and general policy implication of the LEONIE research as regards the European education and training systems, the national dimension and the sectoral level bear on the implementation of a transformative strategy (see the previous chapter) oriented at **fostering innovation in education and training.** This can be accomplished by:

- Enhancing innovation in education and training and promoting innovative networking and partnership arrangements, allowing public institutions to envisage inter-departmental collaboration, support the setting up and running of innovative partnerships, facilitating their medium and long-term sustainability. Likewise, the policy should allow room for envisaging and developing ways of collaboration between teachers, domain experts, animators and other rapidly emerging teaching functions, both within and between institutions;
- Revising policy making at the level of national curricula and programmes, so as to enable the development of those areas of the curricula most amenable to innovation;
- Granting more autonomy to E&T institutions so that these will be able to modify their internal structures along the lines of learners, society and markets' needs;
- Furthermore, more attention should be devoted to the systemic resistance to innovation within education and training; policy actions should rely on successful experiences of innovation transfer and investigate their scalability at different organisational levels.

More specific recommendations for policy actions are listed below.

- **Promote research and dialogue on education and training at the international level** Longitudinal projects dealing with long-duration innovations in one or more institutions would provide insights with respect to sustainability and expansion of innovations into education and training. Also comparative transnational research should be fostered, attempting to analyse and compare E&T systems in a more 'holistic way' than looking only at students outcomes (as it is the case for the OECD-Pisa approach);

- **Cope adequately with policy tensions.** The LEONIE research activity has attempted to demonstrate how the educational and training sphere is currently subject to a series of tensions, although not necessarily opposite. Coping adequately with tensions can give rise to genuine innovation. Policy makers need to find the right blends of policies which foster one, the other or both extremes of the tensions so as to transform potential constraints into opportunities;

- **Re-define and re-align learning systems vis-à-vis the State, the civil society, the voluntary sector and the market**. Leonie has detected the ancillary role of the education and training spheres in relation to the economic sphere. But education is a problem of the entire society, and cannot be considered as a passive transmitter of market paradigms. Consequently, there is a need of making European learning systems the leading area of change and proactivity in the knowledge society. Investing more in developing change management process and learning organisation approaches into education and training can do this. Furthermore, institutional and professional autonomy coupled with social accountability (i.e. socio-political and economic accountability) seem to be amongst the most crucial points;

- **Avoid self-referentiality of Educational, training and informal learning systems.** This does not only mean that partnerships and inter-organisational cooperation should be established (as mentioned above) but also that exchanges of best practices should encompass cross-sectoral, cross-cultural and international learning experiences, management, quality and cost-effectiveness assurance models, research results and capitalisation of experiences;

- **Consolidate the European dimension of education.** A European framework of reference for the transparency of qualifications' is needed in this respect. Virtual and physical mobility is to be increased by active sponsorship and by removing obstacles;

- **Improve and diversify investment in social capital.** In the current economic and budgetary climate, the case for a 'substantial increase' in investment in human resources sought by the Lisbon European Council remains stronger than ever, particularly as it conditions future growth as well as social cohesion. Required funds should be raised efficiently with a well-balanced mix from public as well as private sources. Also, the education system has to become more efficient and of better quality. For this purpose, it is important to open up the institutions (self-government);

- **Let lifelong learning become reality for all citizens.** To achieve the goal of lifelong learning, comprehensive, coherent and well-coordinated strategies are needed. Appropriate measures have to aim at disadvantaged groups. Common European centres of reference and principles have to be applied. Individuals' personal development and fulfillment, their social and professional integration and any subsequent learning is largely dependent on the acquisition of a set of key competences by the end of obligatory schooling (foreign languages, mathematical literacy and basic competences in science and technology, ICT skills, learning-to-learn skills, interpersonal and civic competences, entrepreneurship and cultural awareness).

1. INTRODUCTION

For too long, education and training provision have been constrained by a simplistic reductionist identity as vectors of knowledge. We are entering a post-industrial world in which the needs of society and the forces that create meaning are moving rapidly away from those that gave form, meaning and purpose to traditional learning provision.[1]

In this context, are European education and training systems leading the way towards the knowledge society or just trying to adapt to the short-term economic agenda? Are they increasing their role from an ancillary service to a leading force of economic and social development?

LEONIE[2] i.e. Learning In Europe, Observatory on National and International Evolution, co-funded by the Socrates programme, Action 6.1 'General activities of observation and analysis', was set up to tackle these fundamental questions. In particular, it aimed at developing the predictive and proactive capacity of European learning systems by:

1. Identifying major drivers of change, in economy and society, which impact the present and future development of education and training;
2. Identifying and developing a capacity to monitor the innovation processes that are taking place within education and training systems, and that are intentionally implemented by the relevant authorities and players;
3. Building and validating a series of indicators that will allow comparisons in time and between countries, of change processes influencing education and training;
4. Establishing a capacity to forecast the likely evolution of education and training in Europe;
5. Building different levels of multi-actor partnership to make the validated observation components sustainable in the medium and long term.

The project had two primary target groups:

● Policy makers who are in charge of running and innovating education and training systems at local, regional, national and European levels (including social partners, representative of teachers and learners, etc);

● The research community studying the unprecedented period of change affecting education and training.

A secondary (indirect) target group was constituted from all education and training stakeholders in Europe.

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[1] 'Education at the Cross Roads: the Futures of Schooling', Marcus Bussey, URL: http://www.metafuture.org/articlesbycolleagues/MarcusBussey/Bussey%20EDFUTURE%204.htm
[2] URL: http://www.education-observatories.net/leonie

2. METHODOLOGY

LEONIE is an observatory project intended to contribute to the on-going analysis of learning systems evolution carried out by agencies such as EURYDICE, OECD and CEDEFOP and many European and national agencies.

In order to do so, the Leonie consortium has first of all conducted an **internal desk research** on the issue of change within European learning systems, relying on the research and forecasting capacity of the Leonie partnership. This research activity has consisted of monitoring and reviewing the outcomes of future studies made at national and international levels and consequently defining a theoretical approach to analyse change processes taking place in learning systems. This approach is described in more detail in the following chapter.

On this theoretical basis, the LEONIE consortium has carried out two extensive surveys. The first, relying on the **Delphi Methodology** and addressing experts of E&T, had the purpose of forecasting the likely evolution of education and training in Europe over the next 10 years and of building consensus on the policies reckoned more likely and appropriate to face the challenges brought by the innovation processes that are taking place within education and training systems. Parallel to the Delphi Survey the project carried out a **Weak Signal Survey**, in order to study national and international evolution of learning in Europe from the perspective of E&T stakeholders. Weak signals are events that are under the surface, overlooked, but that may be a sign of big evolutions to come. Most planning approaches, however, fail to perceive or record such signals, or dismiss them because typical evaluation techniques allow identifying only strong trends.

These surveys, inspired by an innovative combination of quanti-qualitative approaches, represented two parallel and complementary processes. Their main features are summarised below:

Table 2: Main Features of the Delphi & Weak Signals Surveys

Type of Survey / Main Features	Delphi Survey	Weak Signal Survey
Target Groups	E&T knowledgeable experts in Europe	E&T Stakeholders (students, parents, researchers, teachers…)
Objective	Forecast, consensus building on trends of change and policies	Acquiring divergent/creative signals/views
Methodology	Three-round consensus building process quanti-qualitiative carried out on line	Anonymous quanti-qualitiative online survey based on the weak-signals theory
Results	Set of trends and change likely to affect learning systems from inside and outside, set of policies related to these trends considered likely/appropriate	Set of strong, rather strong and weak or divergent signals: narrations of future learning

The study results of the Delphi and Weak signal surveys were presented in eight **national seminars** to validate their outcomes in the light of national and sectoral specificities. The aim of the national seminars was to present international Leonie results to national education and training experts to get their views, thoughts and opinions on the Leonie outcomes according to the national context, thus enriching and refining the European Leonie results with specific scenarios and the cultural diversity of European nations and regions. The participants of the seminars, who represented different sectors and different categories of stakeholders, commented on the results in lively and controversial discussions and drew conclusions thus enriching the research base and the heuristic potential of LEONIE.

Relying on the research basis carried out, the Leonie consortium has been able to spot those issues considered as fundamental by respondents in the form of core tensions. These tensions have also oriented the elaboration of **indicators** to monitor change.

In the following sections we present a synthesis of the research carried out, and describe core tensions in European learning systems emerging from research and their possible implementation in the perspective of 'ongoing LEONIE' activities to support policy-making and strategic planning.

3. TRENDS AND DRIVERS OF CHANGE IN LEARNING SYSTEMS

3.1 A Glimpse at future-oriented Approaches

The desk research carried out in the framework of the Leonie project has focused firstly on existing future-oriented perspectives and studies concerning the evolution of European education and training. On this basis an approach for the analysis of trends and drivers of change affecting education and training has been elaborated, and each project partner, looking at its national context, has produced a list of trends and drivers of change. Finally the project partners have reached an agreement on the most important trends and drivers of change affecting learning systems in Europe. This paragraph summarises the first part of the desk research stage, providing a synthetic overview of forward-looking activities and actions with regard to European education and training. The next paragraph summarises the second part of the desk research.

Future studies in social sciences were very frequent until the end of the 70ies. Sudden and largely unforeseen epochal changes (e.g. the end of communism) have cast some doubts over this field of studies. Nowadays future studies are considered the ideal ground for the Popper[3] approach of falsification: they provide a wealth of lessons on how limited our ability is to think of the future credibly. It is not hazardous that the most frequently used metaphors in the sociological discourse dealing with future evolutions are the 'complex society'[4] or related to generalised uncertainty[5] or risk[6].

Nevertheless, during recent years the methods of future studies developed by the research community have strengthened their foothold outside of the strategy planning rooms of high tech companies and the military. Foresight is nowadays regarded as a compulsory component of regular planning activities of any organization. Scenarios and weak signals are fashionable examples of phenomena called strategic policy intelligence, most commonly applied in the activity of anticipating changes in technology development. The three methods of Strategic Policy Intelligence are: Technology Forecasting, Assessment and Foresight. Technology Forecasting analyses the conditions and potentials of technological development within a concrete framework. Technology Assessment supports decision-making by generating technology- or problem-specific options arising from new developments. Technology Foresight addresses the impacts of technological development on a broader scale.

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[3] According to Karl Popper: 'Any theory not falsifiable is said to be unscientific', The Logic of Scientific Discovery, 1959
[4] For the concept of 'complex society' see for instance Luhmann, N. (1982). Differentiation of society. (S. Holmes, & C. Larmore, Trans.). New York: Columbia University Press
[5] Zygmunt Bauman 'The Individualized Society'. Cambridge: Polity Press. (2001)
[6] Ulrich Beck: 'The risk society'

Method	Task	Fields of Application	Kind of Political Issues Addressed	Results
Technology Forecasting	• Based on monitoring developments and taking into account broader aspects, analysis of the conditions and potentials of new technological applications	• Concrete technological framework • Frequently used in the private sector	• Conditions and consequences of technology development in general • Identification of breakthroughs and early-warning function in a specific technological framework	• Support of the political decision-making process adequate to the reality of the knowledge-based economy, including the identification of breakthroughs and early-warning function • Preparation of integrated S&T policies based on more robust knowledge • Access to intelligence on a wide range of themes, which reduces the lead-time of policy preparation • Avoiding errors from not considering the complexity of the underlying development and possible side-effects of a decision
Technology Assessment	• Support decision-making by generating options arising from new technologies	• Technology or problem specific • Long tradition on avising national parliaments	• Potentials of specific technologies or technological issues related to certain problem, sometimes linked to a concrete public requirement	
Technology Foresight	• Adress a wide range ot themes in order to examine the broad social, economic and environmental aspects of new technologies	• Support national or supra-national policy-making	• Broader impact of technological development, identification of cross-cutting issues • Identification of breakthroughs and early-warning function in a broader cotext	

Figure 1: Comprehensive Perspective of Strategic Intelligence & Possible Contributions to Political Decision-Making[6a]

During the 1950ies and 60ies forecasting was focused on the identification of the most probable future. Extrapolating the trends and identifying the patterns of change achieved this. Since the 1970ies the increase in discontinuities in economic and societal development made it difficult to do forecasting based on the previous development. The oil crisis was the first well-known example of uncertainties that could not be anticipated by means of trend-extrapolation. Various scenario-models soon replaced the trends. The weak-signals theory started to gain popularity among the future studies experts at the beginning of the 21st century. John Naisbitt wrote about megatrends already in 1982. Megatrends could be seen as opposites to weak signals, although a weak signal could develop into one. The following graph describes the characteristics of weak signals, trends and megatrends.

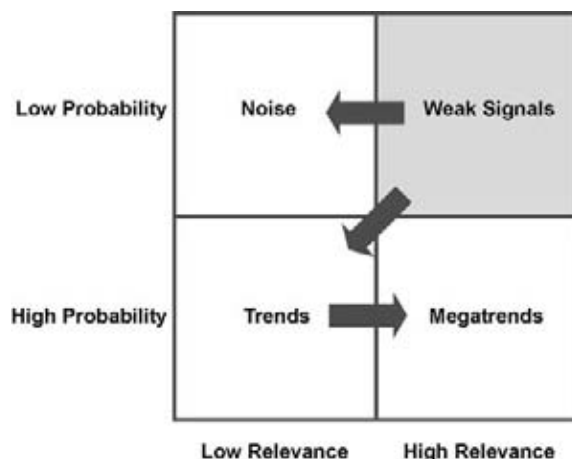**Figure 2:** Characteristics of Weak Signals, Trends & Megatrends

[6a] Note: The dotted lines show that the tasks, fields of application and kind of political issues address ed sometimes overlap. The vertical arrows in the results column represent the synergies arising from the comprehensive perspective of the results of Forecasting, Assessment and Foresight. [Source: Alexander Tübke (JRC-IPTS)]

The Internet was a weak signal during 1993-95, at least from the point of view of the majority. The snowballing effect we have witnessed in the growth of the Internet is an example of autocatalytic strengthening of a weak-signal. Today the Internet is an example of a megatrend. A well-known example of cross-catalytic strengthening of weak signals is the development motorways and their relation to the number of automobiles, both weak-signals of the beginning of the 20th century. Today some societies have developed urban structures in which it is almost impossible to live without a car (e.g. Texas and California). Weak signals that do not strengthen will fall into the category of meaningless noise.

The core purpose of foresight is to prepare ourselves for the future and not for any future but for the future that is most desirable for us. According to the Strategic Choice Theory (Ralph D. Stacey) everyone tries to formulate their desired future, as a result of this no-one will have the desired future, and the reality will focus on negotiation, ongoing interplay that form the organizations. Successful foresight is a collaborative and iterative process (based on Mika Aaltonen, Finland Futures Research Centre).

Figure 3: The Three Cornerstones of Foresight

To sum up, the approach to foresight which is developing nowadays endorsed by Leonie can be synthetically described as follows: 'if we consider the number of alternative futures being 'n', then the future that will be realized is always 'n+1'. Understanding the alternatives included in 'n' alternative futures will help us in preparing for the n+1th future'[7].

Another relevant contribution, in a policy perspective, at future-oriented approaches come from international agencies. If one considers, for instance, the **European Union**, the future of education is dealt with both at a forecasting/strategic level, and at a policy level, mainly in terms of policies and targets.

At a forecasting level, the forward study unit of the European Commission has elaborated some scenarios for Europe in 2010, including some considerations on the future of education[8].

A more recent study with a specific focus on Vocational training has been carried out by **CEDEFOP** on 'Scenarios and Strategies for Vocational Education and Lifelong Learning in Europe'[9].

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[7] Mannermaa, Mika (2000) Globalization and Information Society – Increasing Complexity and Potential Chaos. Article for the Encyclopedia of Life Support Systems, Edited by Sohail Inayatullah

[8] European Commission, Scenarios Europe 2010; URL: http://europa.eu.int/comm/cdp/scenario/index_en.htm

[9] 'Scenarios and Strategies for Vocational Education and Lifelong Learning in Europe', CEDEFOP 2002; URL: http://www2.trainingvillage.gr/downloadscenarios/Tallinn_main_1101.doc

This study has identified a set of critical dimensions/tensions of evolution for vocational education and training in the European scene:

● Weak/strong restructuring for competitiveness;

● No or few/many partnerships;

● Low/high degree of mobility of labour;

● Low/high degree of modernisation of the workplace;

● Low/high contextually responsive VET providers;

● Weak/strong demand for general skills in conjunction with in-company training;

● Training is not so much/mainly an individual's responsibility;

● Training is to a lesser/large degree used to protect socially certain groups.

Furthermore, the Institute for prospective technological studies of the European Commission, despite focusing mainly on ICT, has produced some reports dealing explicitly with innovation and change processes affecting education and training in Europe. (e.g. Demographic and Social Trends Issue Paper: The Future of Education in Europe until 2010)[10]

But the most relevant and visible forward-looking action of the European Union in the field of education and training falls within the framework of the **Lisbon process**.

The Lisbon Strategic target: *"To make the European Union the most competitive and dynamic knowledge-based economy (and society) in the world"* has been translated, as far as education and training are concerned, as the commitment to improve their quality, as their openness to the wider world and as efforts to facilitate access to learning.

The follow-up of the Lisbon process for this policy area, inspired by the open method of coordination, has consisted of a detailed work programme to be completed by 2010, agreed on in 2002 by the European Council.[11] The objectives for education and training, related to the three strategic goals defined in Lisbon, are listed below:

1. **Improving the quality and effectiveness of E&T:**
    – Improving training for teachers and trainers;
    – Developing skills required by the knowledge society;
    – Ensuring access to ICT for everyone;
    – Increasing recruitment to scientific and technical studies;
    – Making the best use of resources.

2. **Facilitating the access of all to E&T systems**
    – Open learning environment;
    – Making learning more attractive;
    – Supporting active citizenship;
    – Equal opportunities and social cohesion.

3. **Opening up E&T systems to the wider world**
    – Strengthening the links with working life and research and society at large;
    – Developing the spirit of enterprise;

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[10] URL: http://www.jrc.es/home
[11] Council of the European Union (2002): Detailed work programme for the follow-up of the report on the concrete objectives of education and training systems, Brussels (6365/02, EDUC 27)

– Improving foreign language learning;
– Increasing mobility and exchange;
– Strengthening the European co-operation.

Relying on the open method of coordination, these objectives have been translated into concrete benchmarks[12], e.g.:

● Halve the rate of early school leavers, so as to achieve a rate of 10% or less;

● Halve the level of gender imbalance among graduates in science, technology whilst increasing the total number of graduates;

● The 25-64 years olds with at least upper secondary education reaches 80% or more;

● The percentage of low-achieving 15 year olds in basic literacy will be at least halved;

● The level of participation in LLL should be at least 15% of adults, in no country should it be lower than 10%.

In more recent documents it has been affirmed, nevertheless, that the success of the Lisbon strategy is seriously at risk and hinges on urgent reform[13]. Three more processes have informed the forward-oriented approach of the European Union with regard to education and training: the so-called **Bologna/Copenhagen process**, aimed at establishing a European space for higher education and Vocational training by 2010[14], the initiative aimed at making **lifelong learning** a reality based on consultation among member states and a collection of best practices, and the **eLearning Action Plan**, aimed at promoting the diffusion of ICT for learning purposes.

The UNESCO, the United Nation's Educational, Scientific and Cultural Organisation's mission is worldwide, and touches Europe tangentially. In the organisation's words, it works as 'a laboratory of ideas and a standard setter to forge universal agreements on emerging ethical issues'. Its current priorities for education, with a target date of 2015, are associated with the UN Millennium goals. It is working in partnership to secure universal access to primary education and to ensure that all boys and girls complete primary school.

The OECD[15], Organization for economic cooperation and development, can be seen as an 'international organization setting the educational agenda'.

The Centre for Educational Research and Innovation (CERI) within the OECD undertakes investigations of long-term trends and innovations. It also has a programme on institutional management within higher education, and a programme on educational building. In the framework of the 'schooling for tomorrow' project[16], a set of six scenarios for schooling in the future up to 2020 have been clustered into three main categories and reported below.

1. Attempting to maintain the status quo

With the 'status quo' scenarios, the basic features of existing systems are maintained well into the future, whether from public choice or from the inability to implement fundamental change:

– Scenario 1.a: 'Bureaucratic School Systems Continue' This scenario is built on the continuation of powerfully bureaucratic systems, strong pressures towards uniformity, and resistance to radical change. Schools are highly distinct institutions, knitted together within complex administrative arrangements. Political and media commentaries are frequently critical in tone; despite the criticisms, radical change is resisted. Many fear that alternatives would not address fundamental tasks

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[12] European Commission, European benchmarks in education and training: follow-up to the Lisbon European Council, 20.11.2002
[13] Communication from the Commission - 'Education & Training 2010': The success of the Lisbon Strategy hinges on urgent reforms (Draft joint interim report on the implementation of the detailed work programme on the follow-up of the objectives of education and training systems in Europe) COM (2003) 685
[14] URL: http://www.bologna-berlin.de/en/
[15] Some basic readings: OECD (2003): Education at a Glance. Paris, OECD (2003): Networks of Innovation. Towards New Models for Managing Schools and Systems. Paris, OECD (2001): What Schools for the Future?, Paris
[16] URL: http://www.oecd.org/dataoecd/36/54/33703138.pdf

such as guardianship and socialisation, alongside the goals relating to cognitive knowledge and diplomas, nor deliver equality of opportunity.

– Scenario 1.b 'Teacher exodus - The 'meltdown scenario'' There would be a major crisis of teacher shortages, highly resistant to conventional policy responses. A rapidly ageing profession, exacerbated by low teacher morale and buoyant opportunities in more attractive graduate jobs, triggers it. The large size of the teaching force makes improvements in relative attractiveness costly, with long lead times for measures to show tangible results on overall numbers. Wide disparities in the depth of the crisis by socio-geographic, as well as subject area. Very different outcomes could follow: at one extreme, a vicious circle of retrenchment and conflict; at the other, emergency strategies spur radical innovation and collective change.

2. Re-schooling:

The 're-schooling' scenarios would see major investments and widespread recognition for schools and their achievements, including towards the professionals, with a high priority accorded to both quality and equity:

– Scenario 2.a 'Schools as Core Social Centres'. The school here enjoys widespread recognition as the most effective bulwark against social, family and community fragmentation. It is now heavily defined by collective and communal tasks. This leads to extensive responsibilities shared between schools and other community bodies, sources of expertise, and institutions of further and continuing education shaping, not conflicting with high teacher professionalism. Generous levels of financial support needed to meet demanding requirements for quality learning environments in all communities and to ensure elevated esteem for teachers and schools.

– Scenario 2.b 'Schools as Focused Learning Organisations'. Schools are revitalised around a strong knowledge rather than social agenda, in a culture of high quality, experimentation, diversity, and innovation. New forms of evaluation and competence assessment flourish. ICT used extensively alongside other learning media, traditional and new. Knowledge management to the fore, and the very large majority of schools justify the label 'learning organisations' (hence is equality of opportunity the norm), with extensive links to tertiary education and a diversity of other organisations.

3. De-schooling:

Rather than high status and generous re-sourcing for schools, the dissatisfaction of a range of key players leads to the dismantling of school systems, to a greater or lesser degree:

– Scenario 3.a 'Learning Networks and the Network Society'. Dissatisfaction with institutionalised provision and expression given to diversified demand leads to the abandonment of schools in favour of a multitude of learning networks, quickened by the extensive possibilities of powerful, inexpensive ICT. The de-institutionalisation, even dismantling, of school systems as part of the emerging 'network society'. Various cultural, religious and community voices to the fore in the socialisation and learning arrangements for children, some very local in character, others using distance and cross-border networking.

– Scenario 3.b 'Extending the Market Model'. Existing market features in education are significantly extended as governments encourage diversification in a broader environment of market-led change. This is fuelled by dissatisfaction among 'strategic consumers' in cultures where schooling is commonly viewed as a private as well as a public good. Many new providers are stimulated to come into the learning market, encouraged by radical reforms of funding structures, incentives and regulation. Flourishing indicators, measures, and accreditation arrangements start to displace direct public monitoring and curriculum regulation. Innovation abounds as do painful transitions and inequalities.

3.2   Trends and Drivers of Change identified by the LEONIE Consortium

In the endeavour to summarize trends and drivers of change, it might indeed be true that many theoretical and methodological issues have to be tackled.

First of all, it is difficult to identify *what is a driver*. Let's consider for instance globalisation, a complex set of phenomena that is undoubtedly shaping our lives. Is globalisation a driver of change? One may argue that there is 'a driver behind the driver', since globalisation is the result of the mature stage of capitalism and it is an expected result of it, identified already more than a century ago[17].

While keeping in mind the relativity of the concept of driver, a second issue, related to the former, arises: *the distinction between trends and drivers of change.* Even though introducing a distinction between 'trends and drivers' may lead to a slippery ground, it can still be reckoned a worthwhile theoretical effort.

In fact, there are forces affecting the post-industrial societies that have a higher degree of autonomy and a greater influence than others. These 'large vectors of change' taking place should be considered drivers of change, and their influence is affecting both education and training and the society as a whole.

On the other hand, other factors of change have an undoubted degree of influence and autonomy, have more specific methodological evidence, and yet they can be traced back to a great extent to the above-defined drivers of change. These can be defined 'trends' of change.

Figure 4: Trends & Drivers of Change and Level of Autonomy & Influence

Another important methodological issue is the following: once trends and drivers are identified, *they may be organised around analytical categories*. This taxonomic activity is also a problematic exercise.

Within the framework of the Leonie project, a first distinction has been introduced: trends and drivers of change are divided into endogenous and exogenous to education and training. It is important to point out that the relationship between endogenous and exogenous factors is complex: it may be bi-directional, (general trends and drivers influence E&T and vice versa) many-to-one

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[17] In place of old local and national seclusion and self-sufficiency, we have intercourse in every direction, universal interdependence of nations. And as in material, so also in intellectual production.» Karl Marx, «The communist Manifesto», 1848)

(many trends reinforce each other and may determine a single E&T tendency) one-to-many…

When it comes to further categorisations, many questions arise. For instance, as far as exogenous trends are concerned, the classification adopted is among four macroareas of change: societal trends, technological, political, and economic trends. What is societal, or political and so on? *Where are the boundaries?* For a long time social scientists[18] conceptualised the continued development of industrial society in terms of growing functional differentiation among the political sphere, the economy and the civil society.

Today these spheres can no longer be conceived as insulated areas: what used to be considered a set of purely 'economic' processes is now also recognised to be embedded in cultural processes and institutional settings. This is the main reason of the difficulties in the categorisation. However, trends of change mainly related to the economic or the political system or society as a whole can be observed and recognised, without being too deterministic.

Finally, one has to take into account that every trend and driver of change does not exert its influence *in vacuum*, but it has to be considered in a certain space and over time. Some trends/drivers may have already fully unfolded their influence, some other may be emerging or declining. Moreover, some trends may have a minimal cyclical effect (less so the drivers) and some other may have a long-term effect.

The Delphi survey and the Weak signal tool enquiry that will follow the theoretical stage of the Leonie project will contribute to include temporality in this exercise, since they are aimed at identifying the most influential trends of change inside and outside the European learning systems over the next decade.

As for space, the comparison between the outcomes of the Delphi survey and the results of national seminars will help to attribute a 'spatial scope' to every trend/driver. In this respect it is important to underline that EU pre-accession countries have gone through the complete renovation of their education and training systems in a radically new environment and a new societal paradigm based on the market economy and democratic society. It will be fundamental to devote particular attention to the specific situation of every pre-accession country as well as to the specific trends affecting current EU member states, but the situations of the pre-accession countries need to be contextualised into the framework of an epochal change.

3.2.1 Exogenous Factors affecting Education and Training

Four driving forces of change, affecting both education and training and society as a whole, have been identified. All the driving forces presented are 'plural', complex buzzwords in the political debate, and yet their meaning can be circumscribed and their influence on education and training can be examined. This is the intent of the following paragraph.

The first one is **Globalisation.** This driver of change refers to the 'increasing integration of economies around the world, particularly through trade and financial flows. The term sometimes also refers to the movement of people (labour) and knowledge (technology) across international borders.'[19] This definition, taken by the international monetary found, is focused on the economic aspect of globalisation. But a more comprehensive definition is required, in order to avoid an economist approach that would limit the extent of our analysis.

As the German sociologist Ulrich Beck points out, it is essential to distinguish "a number of *dimensions* of globalisation: any list of these would have to include, without making any claim of completeness or rigour, the dimensions of communication technology, ecology, economics, work organization, culture and civil society"[20].

Another multidimensional driver of change is related to **Demographics.** Within this dimension one may include the deployment of the so-called 'Aging society'[21], determining also potential shortfalls in the size and capacity of the workforce. Changes in the

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[18] Emile Durkheim, for instance

[19] 'Globalisation: Threat or Opportunity?', IMF Staff, 2000

[20] U.Beck, 'What is globalisation' Polity Press, 2000

[21] According to the United Nations, when the percentage of population of people over 65 years old is more than seven percent, that society will be called 'aging society'.

age structure of the population will affect every category of public spending to some degree. Three areas of public spending are particularly sensitive to demographic shifts: income security, health care and education.

The resulting immigration flow toward developed countries is another significant trend associated with demographics. Whereas the birth rate of European citizens is declining, European population increases will be driven by a considerable influx of Asians and Middle Eastern immigrants. Children of immigrants are estimated to make up a considerable percentage of the school-age population in the forthcoming years. These demographics indicate educators will have to accommodate to the needs of a student population vastly different from those of previous years.

A more qualitative trend to be included in the demographical evolution of modern societies is the 'extension of lifecycles' (especially the youth lasting longer than ever before and expanding through a sort of osmosis in the adult life).

Furthermore, the increased extension of lifecycles (especially the youth lasting longer than ever before and expanding through a sort of osmosis in the adult life) has important implications for learning, especially as far as lifelong learning is concerned. The imperative of 'being young' for people of all ages, together with the new requirements of the knowledge economy, the rise of leisure time and the flexibility offered by the ICT tools, are a powerful spur for adults to getting back to informal and formal learning.

The **ICT revolution** is another powerful and highly visible driver of change. It has started over fifty years ago with the invention of computing, and ever since it has been steadily gathering momentum. In the past 8 years it has exploded into wide public attention and use, with the take-off of the Internet.

The Spanish sociologist Manuel Castells proposes the following definition of this driver of change "Due to the new technological conditions occurring in this historical period, (…) a specific type of social organisation in which the generation, processing and transmission of information become the fundamental sources of productivity"[22]. The increased mobility/flexibility/availability of information and services is one of the most visible phenomena to be associated with the diffusion of information technologies.

Finally, the **Shift in values** affecting the individuals of modern societies is an equally powerful, although less quantifiable, driver of change. The identity of the contemporary individual is no more monolithic, neither centred on a traditional anchorage, be it theological, philosophical or political. Different lifestyles coexist among people, cultures, countries etc. One of the consequences for individuals of this complexity and lack of universally accepted values may be the retreat into their private world. However, the possibility of a 'monadic' existence[23] may be counterbalanced by the emergence of new forms of community (sport supporters groups, NGOs, virtual communities or 'smart mobs'[24]…) and the rise of locally defined identities. Another visible result of this shift in value could be defined 'hedonistic experimentalism': the reduction in job tenure, the compression of families in terms of members and temporal extension and the decreasing average life of communities ('just-in-time communities') are examples of this 'continuous quest for something else' that characterize contemporary individuals.

What is happening in European families is a clear example of the shift in values described: divorce rates have risen as dramatically in Europe as they have in all industrialized countries, creating major changes for children in the family; simultaneously, more children are being born outside of marriage. One result of these new patterns of family formation and dissolution is that a greater percentage of children in the school system in 2020 will come from one-parent families and from families that are experiencing transitions.

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[22] Castells, M. 'The Information Age: Economy, Society and Culture', Blackwell, 1998
[23] See C. Lash: The Culture of Narcisism New York-London, Norton, 1991
[24] 'Smart mobs use mobile media and computer networks to organize collective actions, from swarms of techo-savvy youth in urban Asia and Scandinavia to citizen revolts on the streets of Seattle, Manila, and Caracas. Wireless community networks, webloggers, buyers and sellers on eBay are early indicators of smart mobs that will emerge in the coming decade. Communication and computing technologies capable of amplifying human cooperation already appear to be both beneficial and destructive, used by some to support democracy and by others to coordinate terrorist attacks. Already, governments have fallen, subcultures have blossomed, new industries have been born and older industries have launched counterattacks.' 'Smart Mobs: The Next Social Revolution' by Howard Rheingold, Perseus Publishing; 2002. See also: Zygmunt Bauman 'The Individualized Society'. Cambridge: Polity Press. (2001)

The following non-exhaustive list is articulated around four sub-domains (economy, technology, politics and society) and includes trends of change that, on one hand, are *shaped* by the above-mentioned drivers and on the other hand are *shaping* education and training.

Table 3: Exogenous Drivers of Change. Economy

Economy
Macroeconomic context.
Internationalisation: the increase in foreign trade and investments and the liberalisation of capital flows among borders are clear signals of a growth of international economic exchanges and interdependencies and increased competition on a global scale.
Polarisation of incomes: the gap among the average revenue per capita between developed and developing countries has increased over the last three decades. A trend toward a polarisation of incomes is also observable within developed societies, between the wealthiest and poorest segments of the active population.
Rise of knowledge economy: knowledge is a key resource; the cleavage for every divide in the new millennium. The ability to acquire, manage and keep knowledge determines a competitive edge.
Slowdown of economic growth affecting the worldwide economy in the last two years.
Persisting high level unemployment in Europe, despite regional differences.
High financial volatility at a global scale. The speed and ease of massive capital flows worldwide 'round the clock' is related to the high fluctuations of the stock market options and the currencies.
Micro-economic context (company-level).
Organisational change into companies: Just-in-Time, lean production, flat hierarchies, team-work, employee empowerment in the 'post-fordist' period.
Flexibility: the ability of companies and employees to adapt rapidly to changes in market conditions and technology. It is a complex phenomenon that can be split into four dimensions: numerical flexibility, which refers to 'the ease with which the number of workers employed can be adapted to meet fluctuation in demand'[25], functional flexibility, which refer to 'the ease with which the tasks carried out by the employees can be adapted to changes in demand',[26] wage flexibility concerns the extent to which management is free to alter wages in response to changing labour market or competitive conditions and temporal flexibility that is to say the possibility of adjusting the amount of labour utilized in accordance with cyclical or seasonal shifts in demand by varying the numbers of hours worked in a day week or a year.
Outsourcing: a business strategy based on the economies of scale of devolving some productive sectors on subcontractors is increasingly adopted by European companies.
Mergers and acquisitions on the rise in Europe as also elsewhere as a result of increased global competition.
Corporate social responsibility: 'commitment by businesses to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large'[27].

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[25] EIRR 1985, 'European industrial relation conference' European industrial relation review 138, July

[26] EIRR

[27] Definition provided in the publication 'Making Good Business Sense' by The World Business Council for Sustainable development http://www.wbcsd.org/templates/TemplateWBCSD4/layout.asp?MenuID=1

Table 4: Exogenous Drivers of Change. Technology

Technology
Digital divide: the gap between those who do not have access to - and the capability to use - modern information technology, and those who do. The digital divide also exists between the educated and the uneducated, between economic classes, and, globally, between the more and less industrially developed nations.
IT infrastructure: mobile, wireless broadband and interoperable networks will be more and more developed.
New technological perspectives**: ubiquitous computing, virtual reality.** Computer-based devices become so cheap, seamlessly interoperable and easy to use that they will find application across a broad swathe of everyday activities. The consequent ubiquity of ICT will make unnoticed the continuous human machine interface thus making the borders between virtual and physical reality less recognisable.
New media (e.g. digital television, electronic publishing, videoconferencing, enhanced telephone services…). Modern societies are witnessing a multiplication of communication channels, rarely replacing fully traditional media (radio, TV). On the other hand, different media are converging into the same technological device (e.g. wireless mobile phone, laptop…).

Table 5: Exogenous Drivers of Change. Politics

Politics
Crisis of perceived legitimacy of political institutions: the loss of autonomy of nation states and the inability of governments to respond to societal demands, including the tackling of global risks, has lead to pervasive disillusionment with conventional politics, as expressed in low voter turn-outs or low membership of political parties.
Renewed and widened policy agenda of European and national policy makers over recent years, reflecting citizens' concerns for quality, sustainability, social inclusion, security…
New actors emerging: The increased apathy and disillusion with conventional politics at a moment where demands for democratisation have paved the way to the emergence of new 'unconventional' and bottom-up forms of participation e.g. NGOs and the no global movement. On the other hand a global and European level of governance is emerging as a fundamental arena of policy-making, an example of it being the increasing importance of the European Union, but also the IMF, World Bank, and World Trade Organization…
Regionalisation: increasing political pushes towards the devolution of powers to local authorities coexist and counterbalance the affirmation of globalisation. Multilevel governance and subsidiarity are on the top of the policy-making agenda in Europe, as the White Paper on Governance published by the European Commission demonstrates.
Deregulation: the removal of government-imposed restrictions or controls on the economy, leaving the ground to market forces. This trend, starting from the 80's, is associated with the triumph of the neo-liberal paradigm.
Reduction in welfare provisions: shrinking of the resources available for governments and corresponding cuts in public expenditures (public pension schemes, social services). European welfare states are in crisis because, in a globalised world, they are less able to support levels of benefits for their workforces that are superior to those in competing countries. Furthermore, demographic trends and the increased mobility of potential tax payer capitals decrease dramatically the tax revenues of European governments.
Public-private partnerships: cooperative ventures between the public and private sectors, aimed at meeting clearly defined public needs, are increasing in all the sectors of the economy.

Table 6: Exogenous Drivers of Change. Society

Society
Increasingly diversified social patterns, no longer stereotyped, nor linear, but reversible resulting in a 'consumerism of lifestyles'. Modern societies are characterised by a high differentiation -and sometimes fragmentation- of living patterns, working patterns and patterns of consumption.
New gender roles attribution and definition. The behaviours, attitudes, and activities expected or common to males and females have been radically changed and are expected to change even more in future, due to the entry of women in the labour market and a general acknowledgement of equal opportunities among men and women.
Change in social structure: the traditional elite system of European societies, based on a division into classes or strata in terms of income, gender, ethnicity, power, status, religion, age or some other characteristics have been questioned over recent years by an increased mobility among different classes and the rise of the middle class.
Multiculturalism: the varieties of experiences and background stemming from racial, ethnic, gender and sexual orientation will rise dramatically in European societies, turning them into 'melting pots' with serious risks in terms of marginalisation of minorities and, on the other hand, opportunities related to the end of an ethnocentric approach vis-à-vis all forms of diversities.

The following figure illustrates a graphical representation of the exogenous drivers and trends affecting education and training.
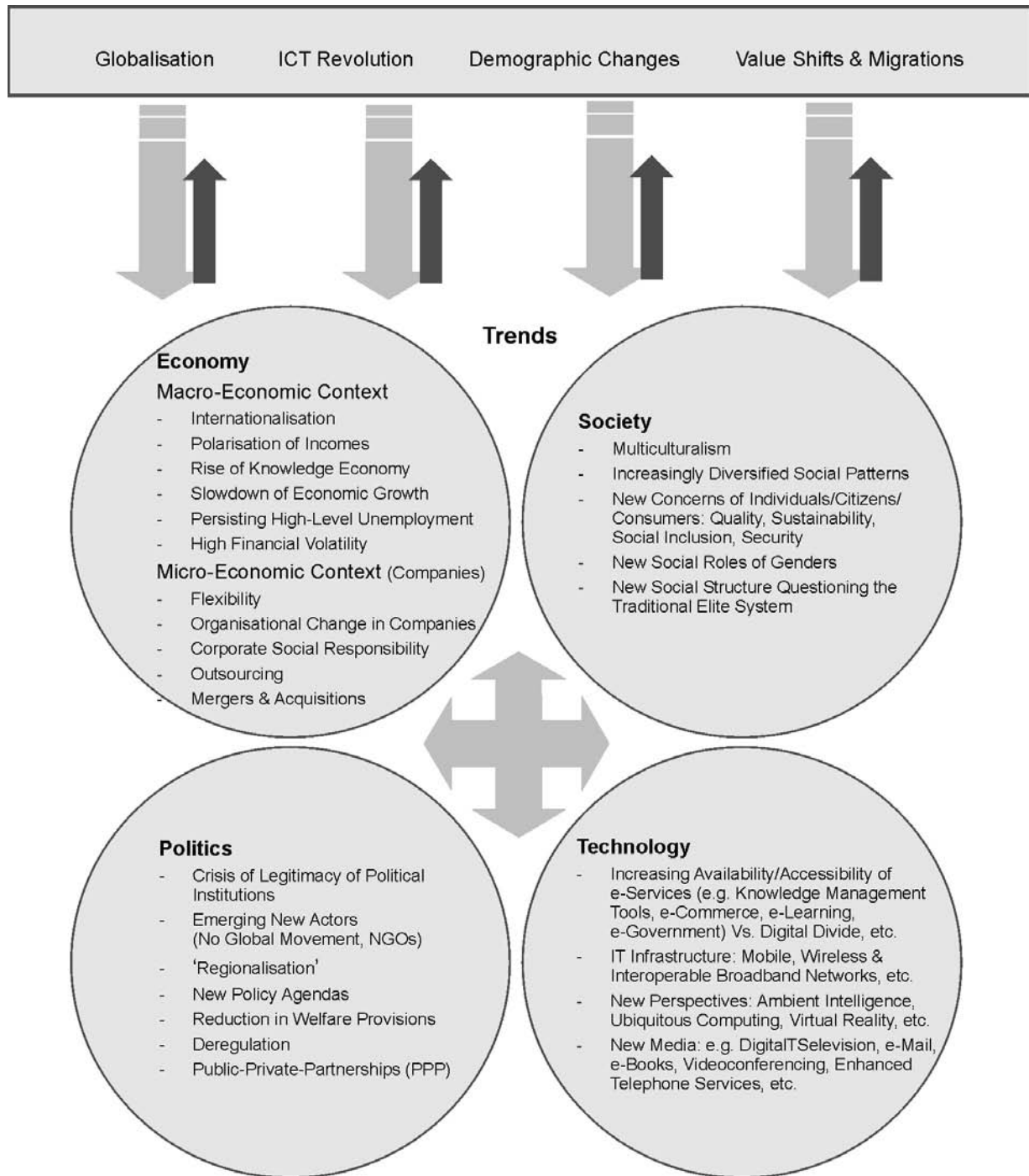

Figure 5: Exogenous Drivers of Change in Education & Training

3.2.2   Endogenous Trends affecting Education and Training

The following non-exhaustive list of trends in education and training is partly inspired by the set of trends identified and the categorisation proposed in framework of the 'L-CHANGE- European observatory in IST- related change in learning system' project and partly derived from the contributions of the Leonie consortium partners dealing with trends and drivers of change in learning systems. Even though it has been pointed out in the methodological paragraph that the relationship between endogenous and exogenous factors is complex and it may be bi-directional, drivers of change have not been identified in the education and training system.

In fact we are witnessing a loss of impact of the E&T system in shaping the broader societal context: thus, the focus of this analysis is on trends of change. They are clustered into six broad categories, or, in other words, domains of change:

1. Institutional context of learning;
2. Organisation, market and distribution;
3. Allocation of resources/value added;
4. Range and Quality of provision;
5. Access to learning;
6. Learning practice: Learner -Provider and Learner- Learner relationship.

The relationship between Learner-Provider and Learner-Learner, embodying two different domains of change in the L-Change 'Scenario and forecast report', has been incorporated into a single category, denominated 'Learning practice'.

Table 7: Endogenous Trends in Education & Training: Institutional Context of Learning

Institutional Context of Learning
Structural changes in education institutes: new architectural models, reorganisation of classroom space, introduction of ICT facilities.
Learning systems guaranteeing **a match between education and training provision** (in terms of competencies and skills of students) and **labour market demand**
Increasing integration of **formal and informal learning,** implying new methods and systems for competence recognition, transfer and accumulation of learning credits that are not necessarily part of the current system of qualification.
Formal education increasingly open to families, local authorities, NGOs… The needs of these stakeholders are more and more taken into account in the formal education and training world.
The E&T system is going 'glocal': there are increasing -ocal/national/international **networking initiatives,** an example of it being the increasing physical and virtual **mobility** of teachers/trainers and learners. On the other hand, **locally determined contents and bottom-up initiatives** in education and training are also on the rise over the last three decades (i.e. minority languages entering formal education).
Increasing average duration of compulsory formal education in developed countries
Fewer students per class in compulsory education. Demographic trends are lowering the students/teachers ratio in Europe, in particular as far as lower education is concerned.
Loss of central role of school as the means of transmitting culture: a vast number of learning opportunities and choices are no longer supported and mediated very substantially by the conventional education and training organisations.

Table 8: Endogenous Trends in Education & Training: Organisation, Market & Distribution

Organisation, Market and Distribution
Public-private partnerships in E&T on the rise. They can be defined as mutually beneficial arrangements that may involve all education and training stakeholders such as governments or local authorities, the community, NGOs and the private for profit sector.
Business-oriented organisational models into E&T institutes. Management practices derived from the business world have been adopted in (and also adapted to?) formal education and training institutes.
Concern for **cost-effectiveness** of learning provisions at all levels. Tighter resources for education and training both in the public and the private sector and the demand for an increase in learners performance led to investigate the ways to enhance cost-effectiveness.
Increasing number and variety of actors in E&T (e.g. museums, libraries, governmental agencies, corporate universities…).
Shortening educational products/services lifecycles: the necessity to respond to the needs of demand require shorter and shorter cycles of production[28].
Increase of Internet-based materials and products for E&T (e.g. e-Marking devices).
Increasing importance of **value added services in E&T** such as consultancies, mentoring, tutoring, assessment, certification etc. is creating new markets for new players as well as new market niches for producers already in the market.

Table 9: Endogenous Trends in Education & Training: Allocation of Resources/Value added

Allocation of Resources
Decrease of public funding in formal education e.g. Governments may switch public funding originally allocated for education for investments and plans for other priorities, such as the security of citizens.
Increasing allocation of resources for the **use of ICT in learning:** the public sector will continue to implement measures of various forms, ranging from funding to ensure a common minimum level of ICT knowledge and integration in all institutions, to rewarding innovative use of ICT.
Teacher and trainer training recognised as the most important asset to provide a good level of education and vocational training for citizens in general.
Investment on **guidance and support services** on the rise, due to the growing role of the informal learning sector as well as the increasing variety and typologies of new competencies and skills necessary for 'digital and knowledge citizens and workers'.

Table 10: Endogenous Trends in Education & Training: Range & Quality of Provision

Range and Quality Provision
Multiplication of learning occasions/facilities/range available: learning environments are now virtual or real, collaborative or self-managed learning, public or private… Flexibility in time, pace, place and contents is growing: this involves changing practices such as moving towards open and distance-based learning.
Quality of learning provisions increasingly acknowledged as important. The promotion of good quality education is becoming a matter of high priority not only for E&T institutions, but for governments as well.
Increasing **personalisation of learning provisions**. This means that learning experiences will be progressively more customized according to the preferences of the learner. Personalization of learning can involve the tailoring of tools, terminals, communications, content, etc. to the needs of the individual.
New learning materials e.g. interactive versions of text books and web-based educational tools for teachers and students.

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[28] L-CHANGE 'Scenario and Forecast Report Year 1'

Table 11: Endogenous Trends in Education & Training: Access to Learning

Access to Learning
Increasing **access to education and training** by new segments of population (immigrants, the disabled, women returnees, people whose situation only allows them to study on a part-time basis) and new demographic cohorts (see below)
Risk of 'skills gap' among learners. Opportunities to access learning provisions, although increasing, remain not homogeneous in Europe, due to different socio-economic, demographic, geographic conditions… It is not just a matter of gaps in education between the ICT haves and have-nots, the so-called digital divide, but skills gaps are related to a variety of 'divides'
Policies for broadening access and social inclusion to E&T at national and European levels are increasingly acknowledged as a fundamental component of the European social agenda
Lifelong learning-continuing E&T: the new requirements of the knowledge economy (need of permanent updating of knowledge), the rise in leisure time and the flexibility offered by the ICT tools, are a powerful spur for adults to getting back to informal or formal learning.

Table 12: Endogenous Trends in Education & Training: Learning Practice: Learner -Provider & Learner- Learner Relationship

Learning Practices: Learner-Provider and Learner-Learner Relationship
Shift from a teacher/trainer-centred to a learner-centred paradigm: increase in learners' autonomy and control of the learning process. From this perspective, educational practice and the educational system as a whole is going to be redesigned with the primary focus on the learner.
Focus on emotional dimension/motivation of learning: pedagogic research, over recent years, has concentrated its attention on 'emotional intelligence' and the role of emotions in motivating learners
New competence model in European E&T, with more emphasis on key-core competences and competences related to ICT/languages to be in tune with the requirements of the knowledge economy
New accreditation schemes and **new assessment standards** necessary both in the education and training sectors to evaluate learners' skills on the new subjects of learning introduced (ICT/languages…).
Less face-to-face communication, less personal contact between Learner-provider and learner-learner, associated with (but not completely replaced by) a parallel increase in virtual communication enhanced by new technologies
Increasing importance of evaluation of learning process and outcomes, both summative (assessing learning outcomes or impacts) and formative (constantly monitoring and providing feedback regarding learner's performance)

This list of trends and drivers has been further elaborated and rephrased in a synthetic way so as to compose the Delphi questionnaire.

4. RESULTS OF THE DELPHI AND WEAK SIGNAL SURVEYS

4.1 Delphi Survey

In accordance with the overall aims of the Leonie project, this enquiry, addressed to deeply knowledgeable European experts in the field of education and training in the form of a three-round questionnaire, had the purpose to:

● Forecast the likely evolution of education and training in Europe over the next 10 years through the identification of the developments in European economy, politics and society affecting learning systems and the major trends and drivers of change internal to European E&T systems;

● Build consensus among policy makers on the policies reckoned more likely and appropriate to face the challenges brought by the innovation processes that are taking place within education and training systems.

This report illustrates the main features of the Delphi methodology and provides a critical analysis of the Leonie Delphi survey final outcomes.

4.1.1 The Delphi Methodology

The Delphi methodology has been adopted to run the survey, with the aim to gather, through three consecutive rounds of questionnaires, the opinions of European experts in the field of education and training.

The Delphi process requires that experts consider the issues under investigation and make predictions about future developments. Developed by the Rand Corporation for the U.S. Air Force in the late 1960's, Delphi is a method of forecasting and building consensus based on independent inputs regarding future events.

The Delphi method is therefore dependent upon the judgment of experts. This is a particular strength because, in addition to quantitative factors, predictions connected to policy decisions are influenced by personal preferences and expectations. The Delphi forecast methods reflect these personal factors. Furthermore, the respondents are often in a position to influence events and, thus, make their forecasts come true.

The LEONIE Delphi survey utilizes three on-line rounds of questioning, including feedback of earlier-round responses, in order to take advantage of group input while avoiding the biasing effects possible in face-to-face panel deliberations.

In fact, panelists respond anonymously, preventing the identification of a specific opinion with any individual or company. This anonymity also provides the comfort of confidentiality, allowing panelists to freely express their opinions, and enabling previous responses to be revised in subsequent rounds.

The questions proposed in this survey call for a response in the form of a number or a text option. On the basis of the aggregate outcomes, the IQR (Inter-quartile range) per every item rated by respondents is calculated. The IQR is the range bounded at the low end by the 25th-percentile value, and at the high end by the 75th-percentile value of the aggregate answers. The minor or major extension of the inter-quartile range provides an indication of the lower of higher degree of uncertainty among respondents.

The revisions take place when the answers of an expert are diverging compared to those-aggregated-of the other experts, i.e. they are out of the IQR: in this case the expert is requested to review the answers provided in the former round, thus re-entering in the inter-quartile range, or confirm their divergent answers and, in this case, explain why.

The results of such a process are fed to the second round and the third round cycle, in which the aim is to obtain progressively a general convergence of answers (i.e.: the majority of respondents re-positioned themselves within the IQR).

Experts had also the option to suggest trends of change or policies in addition to those proposed in the Delphi questionnaire. Some of them (i.e. those that did not overlap with the ones already included) have been rated by panellists in the following round, therefore enriching the analytical basis of the research.

4.1.2 The Sample

A list of 262 European experts in the field of education and training has been elaborated for the survey. Members were selected by every project partner on the basis of the position they occupy with regard to education and training development in Europe.

Among them, 92 have participated in the first round of the Delphi survey. The following graph illustrates the composition of the sample as far as the field of expertise of respondents is concerned. The respondents' background is mainly related to education and training, whereas the business, research and policy-makers are less represented.

However, a significant percentage of respondents (17%) have declared to belong to more than one field of expertise.

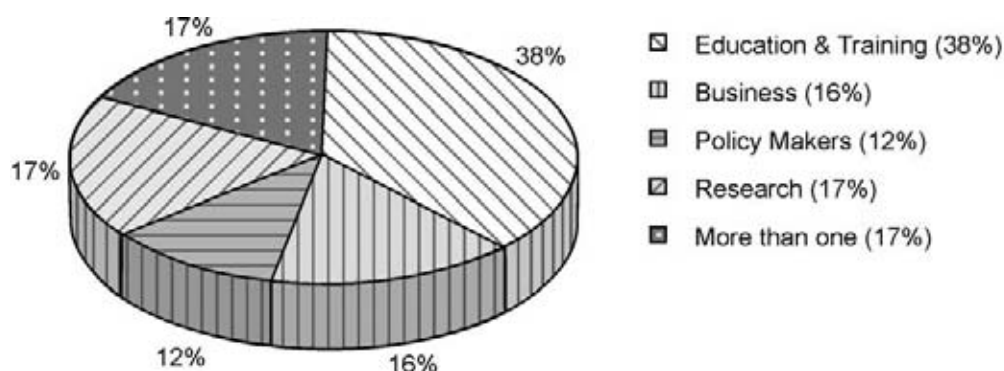**Figure 6:** Fields of Expertise

The granularity of the sample in terms of country of origin of the respondents is represented in the following graph. With regards to that it is important to point out that all the countries involved in the project are represented, pre-accession countries such as Hungary and Romania being slightly more represented than others.
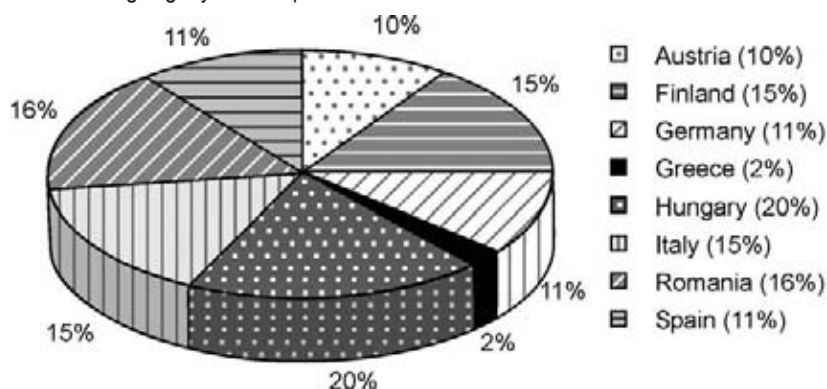

Figure 7: Country of Origin

A drop in the participation to the survey has been registered in the second and third rounds: 35 experts ensure their collaboration during all the stages of the Delphi enquiry, 58 experts took part in the second and third rounds, out of the 92 who took part in the first round. This is by some means physiologic, since the experts' willingness to answer, often in strict time constraints, is usually higher at the beginning of the Delphi survey than at its subsequent stages.

4.1.3 The Outcomes

Before providing an overview of the outcomes of the Delphi survey, it is important to remind the reader of the structure of the questionnaire. Following the preliminary desk research conducted by the Leonie consortium on the issue of change into European learning systems, four driving forces of change, having causes and effects in a broader world than European learning systems, but with a significant impact on it, have been identified, namely **globalisation, shifts in values, the ICT revolution and demographic change**.

In relation to the above-mentioned driving forces, a list of trends of change affecting education and training in Europe has been elaborated. The trends have been divided into **exogenous/external** trends (that is to say taking place in European politics, technology, economy, and society and having an impact on education and training), and **endogenous/internal** trends, shaping 'from inside' the evolution of education and training in Europe.

Therefore, in the **Delphi survey**, respondents were required to rate, on a scale of one to seven, the influence of several trends of change, both endogenous and exogenous, in shaping the European education and training systems over the next 10 years. The second part of the questionnaire dealt with policies intended to influence education and training over the next 10 years. Respondents have been invited to read a list of policies intended to cope with the changing learning system in Europe and to spur its developments. In this respect, respondents were requested to indicate, for each of the policies proposed:

a) To what extent they consider them likely to be implemented over the next 10 years by the EU and the member states;

b) To what extent they consider them appropriate for the positive development of the European learning systems over the next 10 years.

The trends of change (both endogenous and exogenous to education and training) reckoned as most important by the participants in the Delphi survey, have been clustered according to the analytical dimensions identified in the preliminary desk research (economy, institutional context of learning, learning practices…). Per every cluster, represented by a 'bubble', only the 3-4 trends reckoned as most influential by respondents were included. The order of the clusters is not neutral: on the whole, the trends belonging mainly to the dimension named 'institutional context of learning' have been considered as more influential than the trends related to the dimension 'organisation, market and distribution' and so forth.

It might indeed be true that this taxonomic approach could be questioned, or considered too rigid (it is indeed difficult to classify dynamic multi-faceted forces such as trends of change). Nevertheless, one cannot deny that this representation allows appreciating visually the positioning of respondents' learning systems on the key dimensions of change considered.

Drivers of Change

Globalisation | ICT Revolution | Demographic Changes | Value Shifts & Migrations

Exogenous Trends of Change

Endogenous Trends of Change

Economy

Macro-Economic Context
- Rise of Knowledge Economy
- Internationalisation
- Polarisation of Incomes
- Slowdown of Economic Growth

Micro-Economic Context (Companies)
- Flexibility
- Organisational Change in Companies

Technology
- IT Infrastructure: Mobile, Wireless Interoperable Broadband Networks
- Diffusion of New Media
- New IT Perspectives: Ambient Intelligence, Ubiquitous Computing, Virtual Reality

Society
- Reduced Security of Citizens & Workers
- Networking via the Web becoming a Community Power
- Multiculturalism

Politics
- Reduction in Welfare Provisions
- Deregulation
- Public-Private Partnerships (PPP)

Institutional Context of Learning
- Increased Integration of Formal & Informal Learning
- Learning Systems matching E&T Provisions
- Increasing Networking Initiatives

Range & Quality of Provisions
- Diffusions of New Learning Materials
- Quality of Learning Provisions
- Multiplication of Learning Occasions/Spaces

Learning Practices
- Growing Importance of Social Skills
- New Competence Models
- Increasing Importance of Evaluation of Learning

Organisation, Market & Distribution
- Concern for Cost-Effectiveness
- Importance of Value added Services
- Marketisation of Education

Access to Learning
- Lifelong Learning (LLL)
- Increasing Access to E&T
- Risk of 'Skills Gaps' between Learners

Allocation of Resources
- Increasing Allocation of Resources for ICT in Learning
- Rise of Teacher Training (TT)
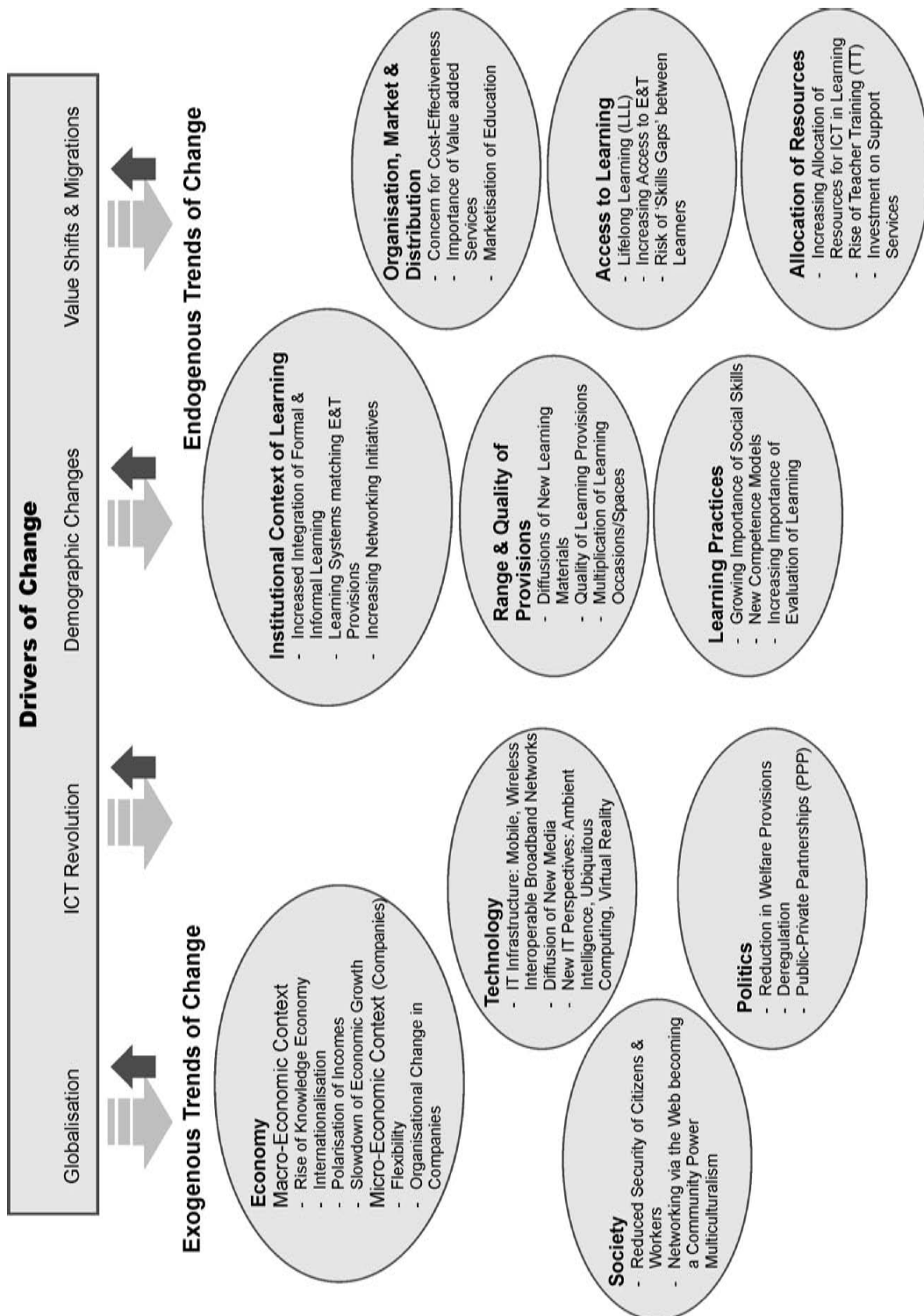- Investment on Support Services

Figure 8: Drivers & Trends of Change affecting European Learning Systems: Synoptic Scheme

The second part of the questionnaire invited respondents to read a list of policies intended to cope with the changing learning systems in Europe and to spur its developments. In this respect, respondents were requested to indicate, for each of the policies proposed:

a) To what extent they consider them likely to be implemented over the next 10 years by the EU and the member states, at all institutional levels;

b) To what extent they consider them appropriate for the positive development of the European learning systems over the next 10 years.

The graph below illustrates the ranking of policies on the basis of the average likelihood to be implemented over the next 10 years, according to the sample of respondents.
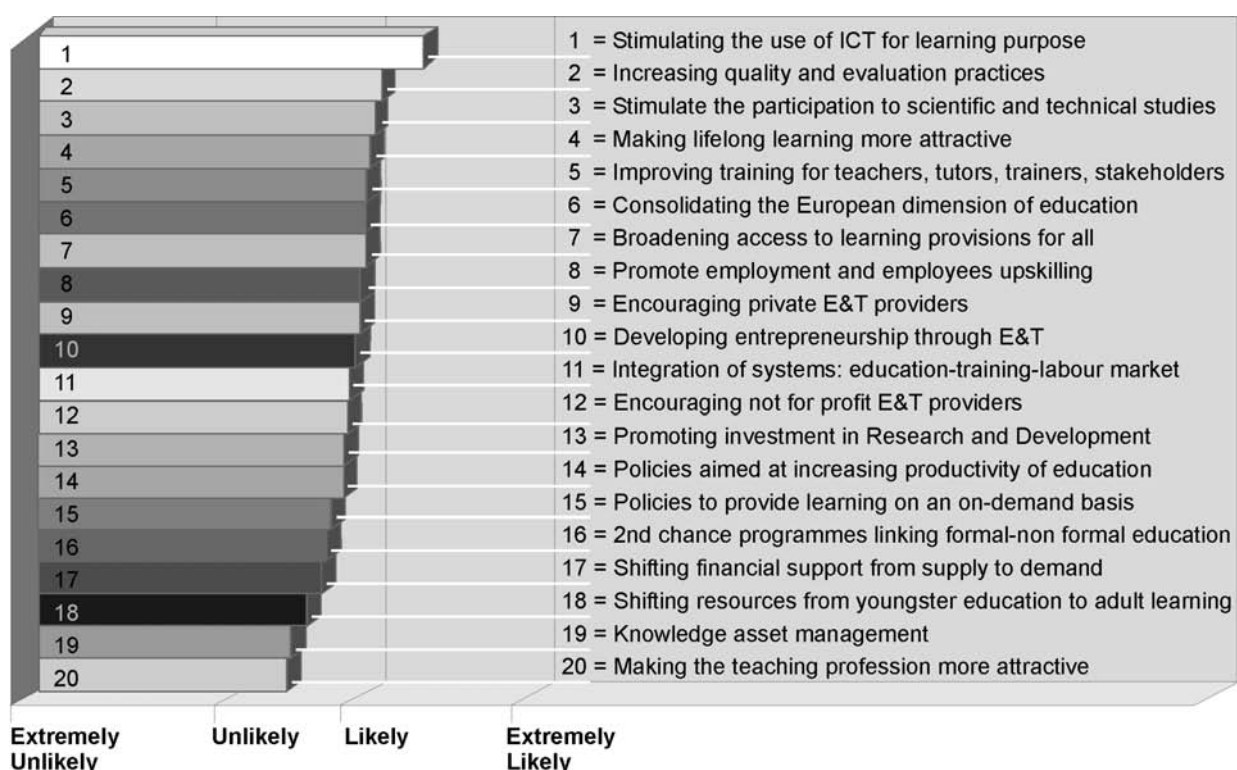

1 = Stimulating the use of ICT for learning purpose
2 = Increasing quality and evaluation practices
3 = Stimulate the participation to scientific and technical studies
4 = Making lifelong learning more attractive
5 = Improving training for teachers, tutors, trainers, stakeholders
6 = Consolidating the European dimension of education
7 = Broadening access to learning provisions for all
8 = Promote employment and employees upskilling
9 = Encouraging private E&T providers
10 = Developing entrepreneurship through E&T
11 = Integration of systems: education-training-labour market
12 = Encouraging not for profit E&T providers
13 = Promoting investment in Research and Development
14 = Policies aimed at increasing productivity of education
15 = Policies to provide learning on an on-demand basis
16 = 2nd chance programmes linking formal-non formal education
17 = Shifting financial support from supply to demand
18 = Shifting resources from youngster education to adult learning
19 = Knowledge asset management
20 = Making the teaching profession more attractive

Figure 9: Likelihood of Policies

As the picture displayed above shows, the respondents are oriented, in general terms, at indicating a certain level of likelihood of the policies proposed, even though they are cautious about attributing high levels of likelihood. If, on the one hand, none of the policies is considered on the average as extremely unlikely, on the other hand, only one of the policies proposed, 'Stimulating the use of ICT for learning purpose' has obtained a rating included between 'extremely likely' and 'likely'. The majority of the others policies reach a rating very close to 'Likely', whereas two policies, 'shifting resources from young people to adult education' and 'making the teaching profession more attractive' are in a kind of a 'grey zone' between the options 'likely and unlikely'.

The graph below refers to the average level of appropriateness of the policies proposed for the positive development of the European learning systems over the next 10 years.
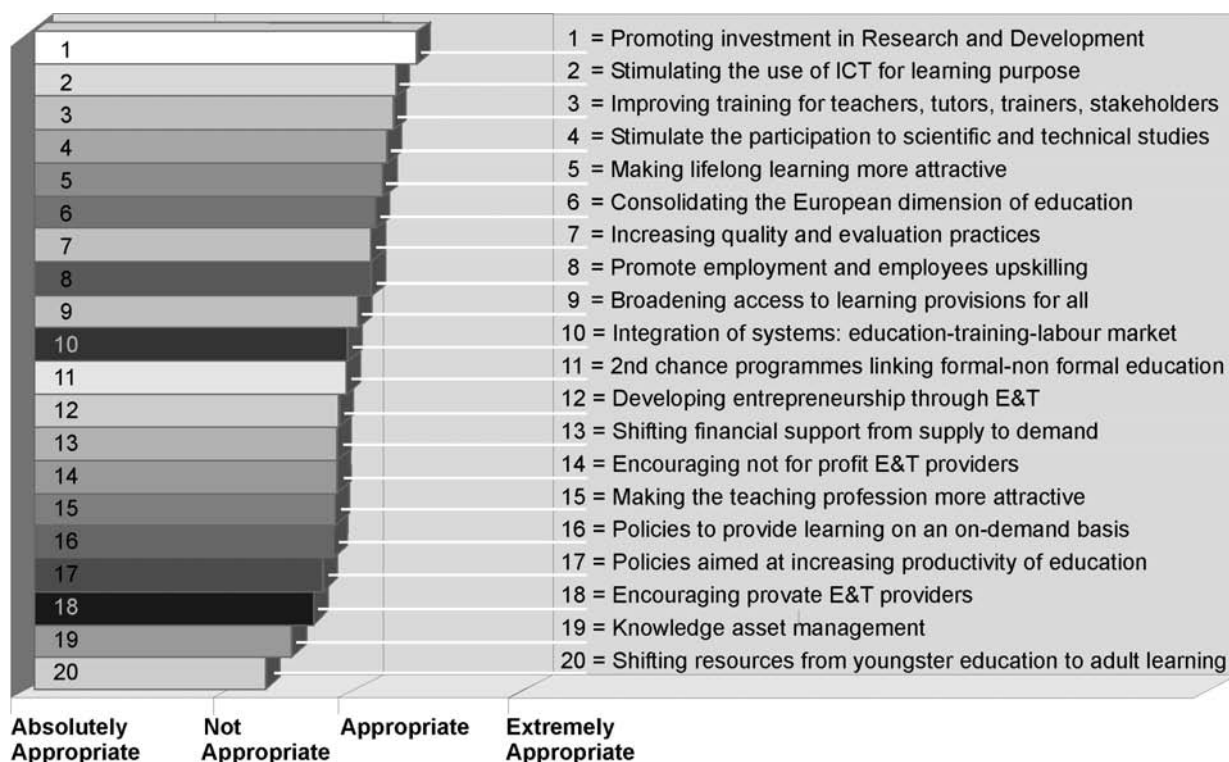
1	1 = Promoting investment in Research and Development
2	2 = Stimulating the use of ICT for learning purpose
3	3 = Improving training for teachers, tutors, trainers, stakeholders
4	4 = Stimulate the participation to scientific and technical studies
5	5 = Making lifelong learning more attractive
6	6 = Consolidating the European dimension of education
7	7 = Increasing quality and evaluation practices
8	8 = Promote employment and employees upskilling
9	9 = Broadening access to learning provisions for all
10	10 = Integration of systems: education-training-labour market
11	11 = 2nd chance programmes linking formal-non formal education
12	12 = Developing entrepreneurship through E&T
13	13 = Shifting financial support from supply to demand
14	14 = Encouraging not for profit E&T providers
15	15 = Making the teaching profession more attractive
16	16 = Policies to provide learning on an on-demand basis
17	17 = Policies aimed at increasing productivity of education
18	18 = Encouraging provate E&T providers
19	19 = Knowledge asset management
20	20 = Shifting resources from youngster education to adult learning

Absolutely Appropriate   **Not Appropriate**   **Appropriate**   **Extremely Appropriate**

Figure 10: Appropriateness of Policies

As far as the appropriateness of policies is concerned, similar considerations could be done. The participants in the survey are oriented, in general terms, at reckoning the policies proposed as moderately appropriate.

Nonetheless, there are significant nuances. Considering the aggregate results, as far as the policy 'Shifting resources from young people education to adult learning' is concerned, the experts have considered its appropriateness as relatively low. All the other policies are in the region comprised between 'not appropriate' and 'appropriate' with a tendency toward this second option. The policies 'Promoting investment in R&D' and 'Stimulating the use of ICT for learning purpose' position themselves at the higher level of the ranking, between the option 'appropriate' and 'extremely appropriate'.

In general terms, the rankings of policies as far as their likelihood to be implemented and appropriateness are concerned, present some similarities. A possible interpretation is that there are basic policies, substantially not controversial, such as 'Stimulating the use of ICT for learning purpose' or 'Making Lifelong learning more attractive' considered so 'desirable' that somehow they are perceived also likely to take place.

On the other hand, such policies as 'Promoting investments in research and development' are reckoned as extremely appropriate but moderately likely. In this case one could argue that some policies could be perceived as more controversial, since they imply, for instance, a complex set of political choices or substantial obstacles related to their implementation. Therefore the desirability factor is not strictly related to the likelihood one.

The graph below provides a cross tabulation of the average level of appropriateness and likelihood of policies, and confirm, in general terms, that high average levels of likelihood correspond to high levels of appropriateness, with the above-mentioned exceptions.
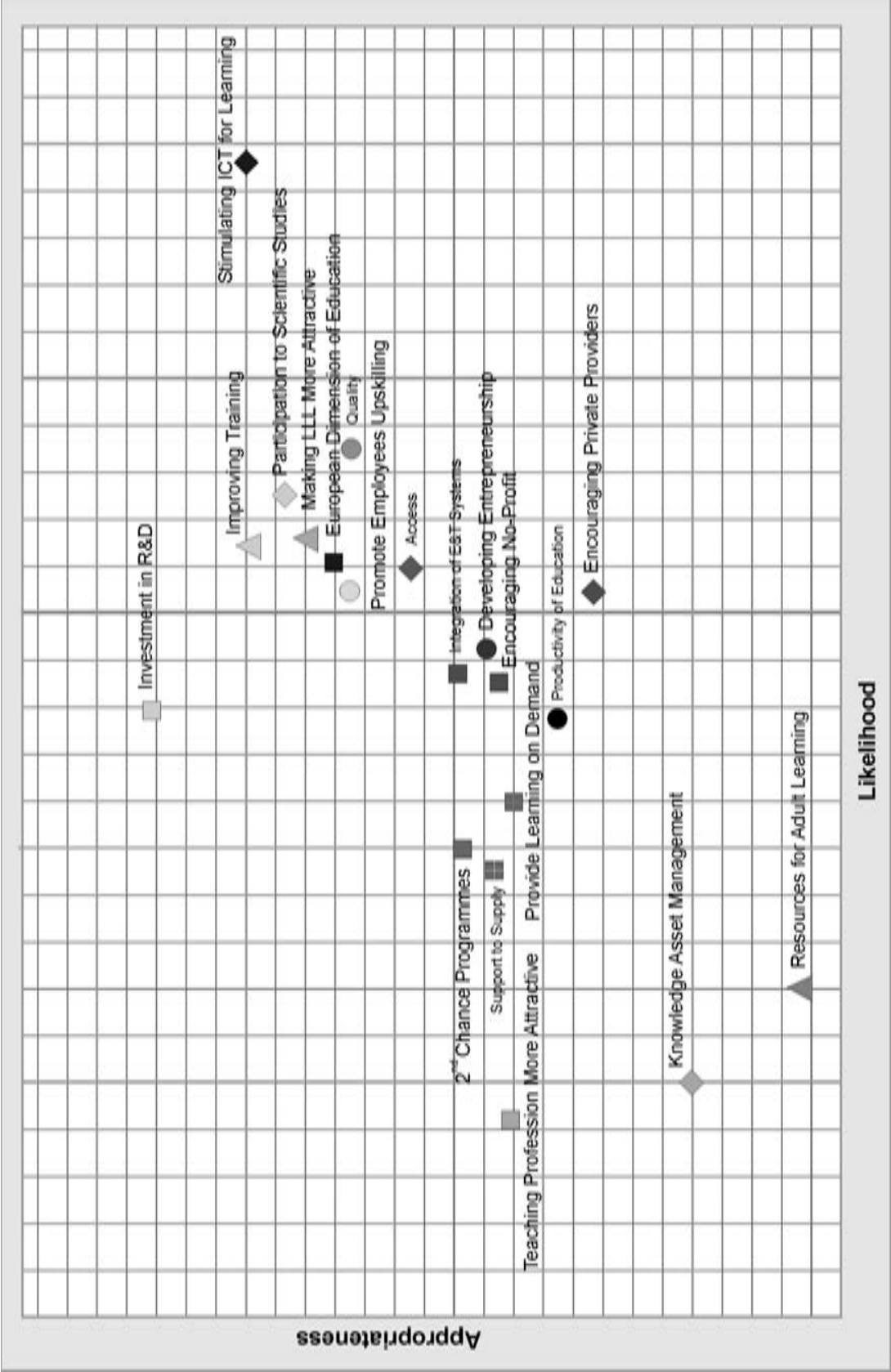
Figure 11: Relation between Likelihood & Appropriateness of Policies.

4.1.4 Conclusions

To sum up, the main findings of the Leonie Delphi survey are as follows:

● The scenario emerging from the answers of the experts, although not definable in a univocal way, is one in which European education and training will become more and more plural in a society more and more plural, more attentive to individual needs and consequently reflective with regard the diversification of learning and living patterns in Europe, more open to cross-cultural/national initiatives and, finally, more and more evolving in accordance with economic macro-trends such as the rise of the knowledge economy, the internationalisation of exchanges and flexibility of companies and individuals. This last development might also imply the massive entry of market paradigms into E&T, according to the respondents.

● In many respects, the results of the 2nd part of the questionnaire (i.e. the one referring to policies) corroborate the ones of the first part (referring to trends), an example of it being the high importance attributed to information technologies within and outside education and training, with relevant implications for the policies to be implemented by decision-makers (stimulate the use of ICT for learning, broadening access etc).

● The issue of contextualising trends in a specific time scale or a defined spatial context (a country, a region) or even in a certain segment of European learning systems (education, training, and, at a further level of granularity, higher education, corporate training etc) is fundamental. The experts seem to point out that *one size fits all* hypotheses are not appropriate to tackle a complex issue such as the future evolution of education and training in Europe. Different trends in different countries are taking place at different speeds and at different institutional levels: the considerable differentiation of European learning systems will continue to exist and produce differentiated scenarios in spite of recognised validity of identified trends across counties and sub-sectors.

● Nevertheless, political initiatives aimed at spurring the developments of European E&T in the same directions are considered moderately likely and appropriate, as the outcomes of the second part of the questionnaire show. On the other hand the experts are somehow cautious about attributing high levels of likelihood to policies, in an economic conjuncture in which the average level of public expenditure into education and training is decreasing in several countries.

4.2   Weak Signal Survey

The Leonie Project also carried out a **Weak Signal Survey** addressed to E&T stakeholders. Weak signals are events that are under the surface, overlooked, but that may be a sign of big evolutions. Most planning approaches, however, fail to perceive or record such signals or, dismiss them because typical evaluation techniques support only strong trends.

The Signals tool is a modification of the Delphi technique. The tool collects the participants' opinions about issues under consideration as stories (their own narratives), which the participants can give as input to the first phase of the inquiry process. In the next phase participants evaluate the same material, signals they created. In most cases there is no need for manipulating (editing, filtering) the material.

All these phases are anonymous, and therefore the method is able to avoid the power filter (Igor Ansoff 1986) that has a tendency to narrow the diversity of the input and evaluation.

In the Leonie project, the Weak Signal method as a bottom-up forecast survey was targeted to specialised 'communities of practice' and their practice-based or procedural knowledge and culturally defined 'life worlds' (learners, parents etc. with their tacit and practical knowledge).

The Weak Signal survey consisted of two phases. In the first phase by using a web-based signals tool the participant's opinions about the future of education were collected. The collection of signals was based on various creativity techniques. The ideas of

the respondents were collected by using three different templates. Respondents were asked to give a short and long description of each idea. The main question of the survey was: "What changes education and training by the year 2020?" In the first template only the main question was presented. In the second template the main question remained the same, but this time there were some additional challenging comments or questions aiming at making the respondents' ideas flow freely. In the third template the main question remained the same, but this time there were some additional comments and questions to stimulate the respondents' creativity. 380 persons took part in the signals collection phase and created 1057 signals on the evolution of education and training.
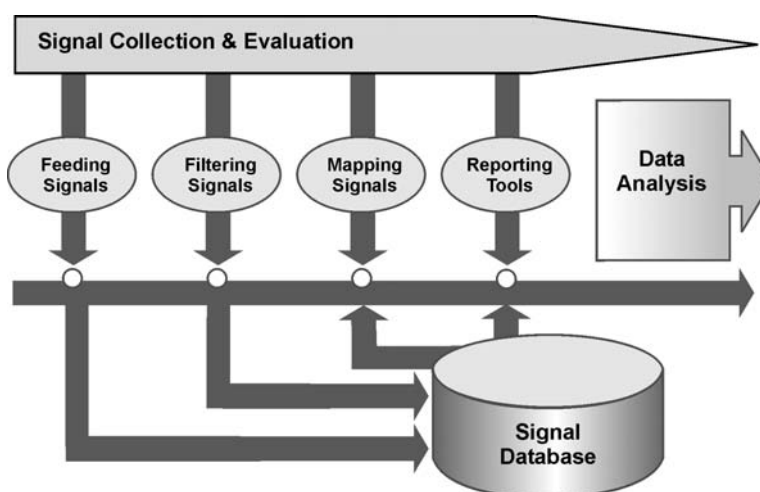

Figure 12: Structure of Signals Collection & Analysis[29]

After the collection phase, the signals were filtered, i.e. test statements and irrelevant input were removed. 787 signals remained to be evaluated by the participants.

In the second phase the participants evaluated the material they created in the first phase. The method of the evaluation phase of the Signals tool is an application of cognitive mapping. It is a cause map where the participants are asked to arrange the signals (issues) under consideration according to their relevance to the reflected issue. In the cause mapping the participant is asked also to draw causal linkages from the presented signal to another. In this simple application it suffices to consider relevance. In order to collect tacit, intuitive and attitudinal information the tool aims at a non-analytical approach; the participants are asked to run the evaluation according to their feelings and no argumentation is requested. 420 persons took part in the mapping phase. Every participant evaluated 30 signals, i.e. they mapped how important the signal was. After the mapping, every participant was asked to produce additional signals, and in total 222 new signals were created in the second phase.

After the signals had been mapped the signals tool grouped the signals into four categories based on their importance and deviation, i.e. strong signals, rather strong signals, not relevant signals and weak signals. The collected data from the evaluation phase is based on one aspect, the distance of the evaluated signal from the center of the cognitive map. This operationalisation provides us quantitative information on qualitative material. The relevance figure is the only collected information. The nature of the material and evaluation process does not allow any thorough statistical analysis. In addition to the relevance figure, the tool provides us only with the deviation information that describes the degree of agreement on relevance among the participants.

The strength of the reporting is that the tool maintains the preliminary/original expression that the participants have used at the beginning. So the researcher's impact on the material is minimized and there is no need for researcher intervention until the results analysis phase.

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[29] Source: Fountain Park Ltd.

The results tell us two issues. The high relevance/low deviation quadrant of the grid report describes the current dominant mental model of the issue (issues that participants agree on to be the most relevant) and low relevance/high deviation quadrant lists issues that only some of the participants have considered to be relevant. These signals are either emerging or dissipating.

The survey generated as many as 356 strong signals but only 18 weak signals. In each category the signals were clustered in eight different baskets. The baskets are the most reoccurring themes of the signals. One signal can have elements of many baskets and can therefore be included in many baskets. The baskets used in this survey were:

- Financial issues;
- Lifelong learning becomes mainstream;
- Internationalisation/globalisation of learning and training;
- Access is important;
- Gap between well-educated and poorly-educated increases;
- Edutainment (games) will partially substitute education and training;
- ICT in education and training;
- Personalization.

The participants to the survey (more than 300) formulated more than 800 replies, which have been voted in a second round consultation and ranked according to their importance and deviation (a statistical indicator).

The high relevance/low deviation quadrant of the grid report (see Figure below) describes the current dominant mental model of the issue (issues that participants agree to be the most relevant) or Strong signals, and low relevance/high deviation quadrant lists issues that only some of the participants have considered to be relevant. These weak signals are either emerging or dissipating as a result of multiple rating by participants in the survey.
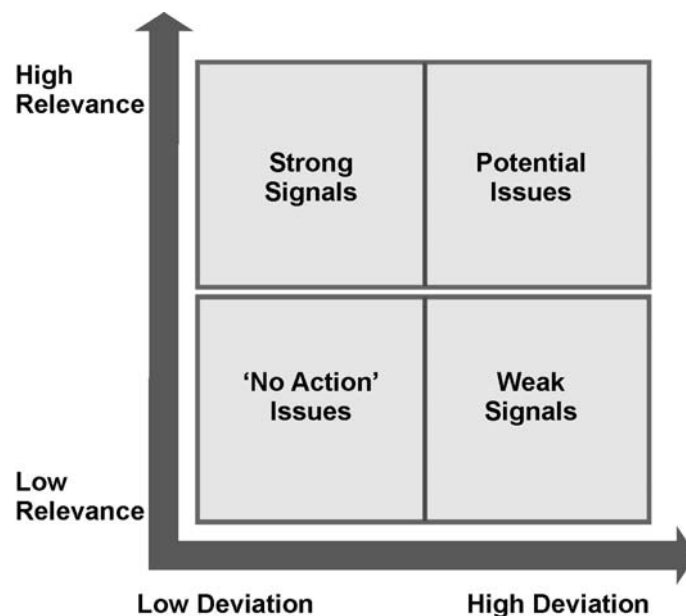

Figure 13: Relation between Relevance & Deviation of Signals[29a]

[29a] Note: Potential weak signals are those with low relevance and high deviation, i.e. issues for further follow up. Strong signals are those with high relevance and low deviation, i.e. important explicit issues.

This section reports some likely statements coming form the practitioners' debate; differently from the Delphi results, and although referring to some of the trends identified there, they 'extremise' the scenarios, not being moderated by the 'experts' consensus' approach of Delphi. We suggest to read them therefore not as the 'likely' future but as an expression of a large debate on the future guaranteed by the Weak signal Survey. It must be clear that they do not represent the LEONIE partners' view, but they are reported to exemplify comments and 'strong opinions' by all kinds of E&T stakeholders.

4.2.1 Strong Signals

Most of the strong signals dealt with lifelong learning, ICT and personalization. By 2020 education will be technology based. Learning and training will become a lifelong activity and lifelong learning will be possible for everybody. Education and training will be tailored according to individual needs, and students will be more responsible for learning. Learning will be more of a learner's driven activity, which allows for fast changes that would not be possible in a teacher-driven system.

Strong signals reflect the mainstream opinions on the future of education and training. The emerging common scenario defined by the strong signals is that education and training will become more and more virtual, but also on-site formation and first-hand experience will be available to satisfy the needs of people learning in different ways. Learners will be able to choose from among different tools/resources/ways of learning.

The **use of new technologies** is influencing the process of teaching/learning by introducing a completely different approach, creating new models and innovative tools. Much more self-training will take place. A teacher's role as a facilitator/enabler will become more prominent. Knowledge sharing will be more interactive between learners and tutors, and between learners. Collaborative learning will become standard, both face-to-face locally and through video, on national and international bases.

Education and training will be more **flexible** and **tailored according to learners' needs**. Problem-solving scenarios, group activities and simulations will replace lectures. There will be more networks between institutions, making it possible for a student to compile his/her education by choosing different modules from different learning centres. The student-centred concept and the overwhelming information flood both mean that learners need to become more critical. New school subjects will be developed around the **personal organisation of knowledge**. Lots of fragmented facts are available, and thus people should have the preparedness to understand the world as an entity and to draw conclusions.

Interactive training will make **education more fun.** Examples like 'flight simulation', 'patient simulation' and 'company simulation' allow to make mistakes without serious consequences (safe failure). Unless learning is exiting, people may become easily bored, have short attention spans, or be unwilling to put their effort to learn something that does not really capture their attention.

In the future, **training and learning** will increasingly become a **business activity**, following the business models describing them as knowledge-based services. The need for continuing education will increase rapidly. A global market for learning supplies will be created to fulfil these needs. The value of traditional diplomas will decrease, as companies need 'doers' instead of diplomas. Paying clients will no longer accept low quality education. ICT will enhance the quality of teaching but the use of ICT does not necessarily ensure qualified teaching.

There will be attempts to **integrate work and learning** and to find new ways of quick and selective knowledge acquisition and transfer in the framework of a multi-level management of knowledge. The importance of informal learning will increase, because the traditional way of teaching cannot be effective enough to provide learners with practical skills and knowledge. Learning will become more and more just-in-time learning. Learners will google up information in small and easy forms and they will have to know how to distil, generate, and mediate knowledge.

Innovations will come from participatory group processes. Interaction among individuals with different perceptions, experiences and expertise will bring forth workable innovations. A culture and environment of openness, ability to learn from each other and to relate theory with practice will results in innovations.

The easy access to information has potential to improve the living standards everywhere in the world, but there exists also a risk that while **privileged learners will continue to gain easiest access** to learning, the **unprivileged ones will be loosing the battle of education and employability** in a fast-growing pace. A sudden leap towards self-directed learning styles will leave a mass of people without possibilities of achieving skills. It may also be that in the future, the few control the world, and the majority has no power. Few persons are managing our business, whether that is education or another branch of commercial activity.

There is a tendency to shift education, an area historically under the control of the individual states/nations, towards the creation of a **global education sphere**. Science has always been international, while education has remained national. In the future, the content of education and training will be internationalised. As companies do business more internationally it also requires education to be oriented this way (curriculum design). This means that people will need to know more than ever how to communicate.

In the future, there may be greater variation in **quality of education and training,** because governments and industry will increasingly influence the provision of education and training, rather than education and training professionals taking the lead in that provision. Performance assessment will become a norm, because computers make it possible to gauge what people can do, not just what they can 'regurgitate' (repeat from what they have heard and read).

4.2.2 Weak Signals

Weak signals are signals with low relevance and high deviation. In the Weak Signal Survey they are signals, which only some participants have considered to be likely and relevant. These signals are not mainstream since they are either emerging or dissipating in learning systems. A summary of the 'weak signals' of the evolution of education and training emerging from the survey is presented below.

Seven weak signals dealt with **financial issues**. According to them the amount of learning would diminish because of recession. In the year 2020 the purpose of education would be to generate profit, which would result in the depersonalisation of education and training. Only corporative universities would stay alive. One of the greater challenges by then would be to make the education so effective that it would enable young people to enter the working force earlier than at the moment to be able to support vaster economy.

Six weak signals were dealing with **edutainment** (games) in education and training. All these signals criticized edutainment in one way or another. According to them there would be a risk of mixing the real life with games. Furthermore, less attention would be paid to other teaching and training services if edutainment would be given priority.

Two signals dealt with **ICT**. According to them virtual work and learning environments and virtual social communities would push individuals to create many identities.

Two weak signals described new ways of learning. According to them Knowledge facilitators, that would stimulate discussions and debates, would replace lecturers. Science would fragment and new scientific areas would probably emerge.

5. NATIONAL SEMINARS: THE LEONIE VALIDATION PROCESS

5.1 Introduction

The project 'Learning in Europe: Observatory on National and International Evolution' (Leonie) aims at contributing to the on-going analysis of learning systems evolution carried out by other agencies and projects (e.g. OECD, eLIG, EUROSTAT, EURYDICE, CEDEFOP, EUN, L-CHANGE, DELOS, E-WATCH, POLE, etc) as well as at establishing a European-level observation capacity on education and training. Therefore, more than 300 European education and training experts and stakeholders have been consulted, with the purpose of gathering their opinions about future developments affecting learning systems and the most likely policies to be undertaken.

This consultation process was conducted by a combination of two survey tools (Delphi and Weak signals) in order to identify major drivers of change, in economy and society, which might affect the development of education and training over Europe in the next 10 years. As a next stage, the study results were presented at eight national seminars to validate outcomes on the European level. Within the Leonie project, this validation process marks the third stage of the project lifecycle as shown in the following chart.
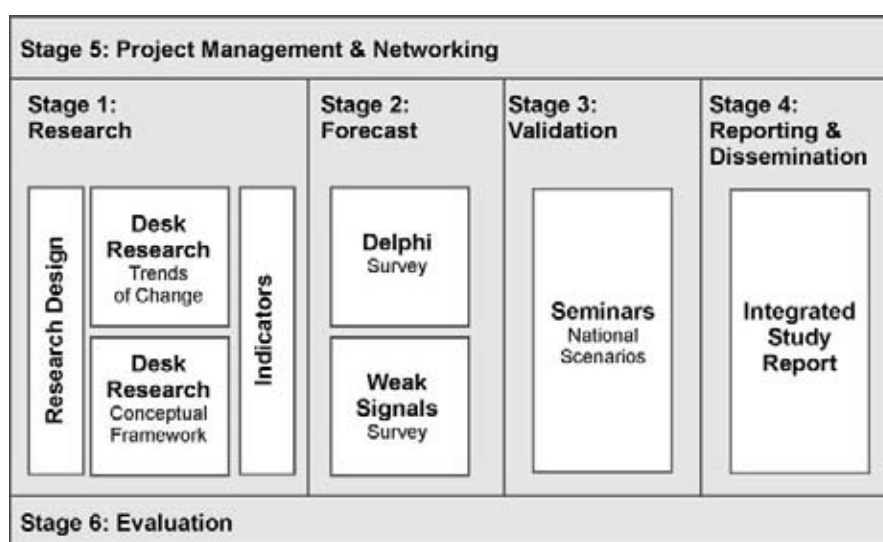

Figure 14: Validation Process

The aim of the national seminars was to present international Leonie results to national education and training experts in order to acquire their views, thoughts and opinions on the Leonie outcomes according to the national context, thus enriching and refining the European Leonie results with specific scenarios and the cultural diversity of European nations and regions. The participants of the seminars, who represented different sectors and different categories of stakeholders, commented on the results in lively and controversial discussions and drew conclusions. So they were to bring national 'flavour' into the project by identifying the trends of change and policy priorities they expected in their countries as well as articulating specific needs they reckon from their point of view.

This validation report is based on eight national validation reports, which resulted from the national seminars held in the eight partner countries (Greece, Austria, Spain, Finland, Italy, Romania, Germany, Hungary) within the Leonie project. The report gives an account of the views and comments the national E&T experts expressed about the Leonie results during their seminars and how they reflected the assessment of particular trends and policy strategies on the European level in relation to the national situation. With reference to the surveys carried out by Leonie, the trends and policies, which were proposed in the Delphi questionnaire, are written in italics in this validation report.

The validation seminars took place between May and September 2004. Greece led the way bringing major trends and drivers as well as policy issues in European education and training systems down to the national reality when it held its validation seminar on May 27th. This first national seminar was accompanied by a project meeting of the Leonie consortium in Athens. Finally, the last national seminar occurred in Pécs, Hungary on September 30th.

Table 13: Schedule of National Validation Seminars

Country	Town	Date
Greece	Athens	27th May 2004
Austria	Krems	24th June 2004
Spain	Barcelona	5th July 2004
Finland	Espoo	2nd September 2004
Italy	Bologna	8th September 2004
Romania	Bucharest	10th September 2004
Germany	Parsberg	12th September 2004
Hungary	Parsberg	30th September 2004

- Researchers & Scientists (41%)
- Administrators & Policy Makers (19%)
- Staff of Public & Private E&T Institutions (16%)
- Teachers & Trainers (13%)
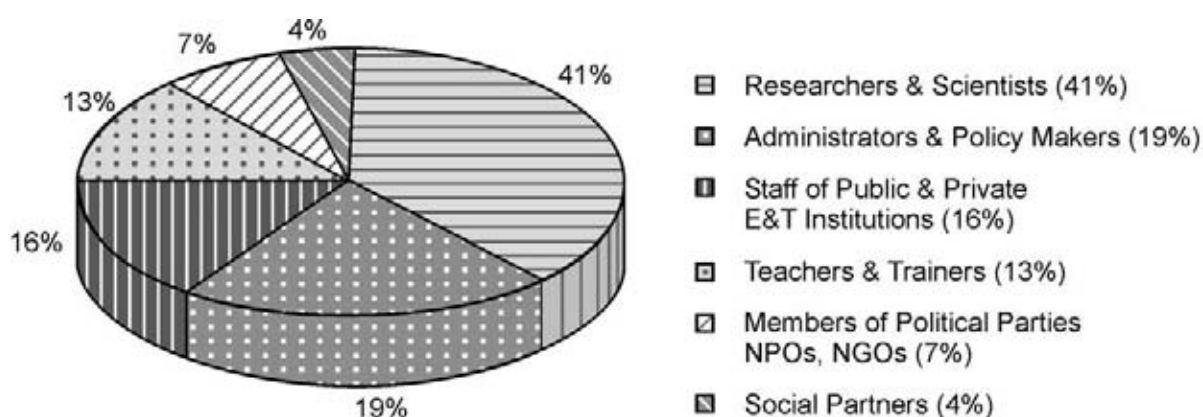- Members of Political Parties NPOs, NGOs (7%)
- Social Partners (4%)

Figure 15: Background of E&T Experts

More than 500 European education and training experts had been personally invited to one of the eight national seminars organised and carried out by the participating countries in the Leonie project. Finally a total of 330 stakeholders actually attended the seminars. This is an average of more than 41 experts per national seminar. As displayed in the chart above, the participants had a widespread professional background as they came from various fields of expertise, ranging from policy makers, public

and local administrators, researchers and University professors, Union members, staff members of public and private E&T institutions, NGOs and NPOs, to practitioners from secondary and vocational education institutions.

Agenda Setting

Nearly all organisers of the national seminars were able to adopt the proposed agenda Leonie partners agreed upon before the validation phase. That is to say that the Seminars were split into two sessions: the morning session was allocated for the major trends and drivers of change, whereas the afternoon session was dedicated to the discussion of international and national policy strategies as well as to the guest speakers.

Essential parts of each session were the discussions in the working groups after the presentation of the corresponding Leonie results. Therefore, the audience was divided into two parallel working groups for achieving better and more fruitful discussions. The parallel working groups had moderators and minute takers, who reported the results of the discussions in the plenary sessions afterwards. During the presentations the participants gave comments and suggestions on the findings presented.

5.2 Discussing LEONIE Results: Trends affecting European E&T

5.2.1 European Trends and National Realities

In the Delphi survey, European E&T experts were asked to rate trends of change affecting education and training **on the European level** considering their influence in shaping European learning systems in the future. Experts had also the option to suggest trends of change in addition to the proposed list in the Delphi questionnaire, which were added to the second and third rounds of the Delphi survey. 92 European E&T experts participated in the first round of the survey.

There was a general agreement at all national seminars that the majority of the trends identified by the Leonie surveys exist in their countries too. Indeed, the characteristics of most of these trends were perceived as more or less variant as they come on a different level of influence in each country varying both in extent and development stage.

The most dominant themes of discussion in all eight countries were issues regarding ICT and the diffusion of new media. The participants of the national seminars confirmed the assessment Delphi respondents put forward that it is a leading trend in European E&T. However, different stages of development in different countries were observed and the trend was also considered controversial within the national seminars.

Other main points which came up for discussion were concerned with Quality and evaluation, financial constraints, internationalisation, social inclusion and the digital divide, lifelong learning, flexibility as well as an increasing commodification (or marketisation) of education.

Some additional phenomena –which were considered relevant to the development of E&T systems but not taken into account by the surveys – were brought up during the national seminars. In Spain for example, migration, reactions against the highly programmed society, changes in the family system, changes in beliefs and ways of life and many other social phenomena were perceived as perhaps more important than the trends found by Leonie, which mainly referred to issues related to economy. Finnish seminar participants raised serious questions about terrorism and security, asking whether teachers and schools are safe anymore. It was stated that the "prevailing phenomenon in the society is uncertainty and that creates different kind of substitutes: religion, ethicality and security issues are interesting indicators of this phenomenon". Romanian E&T experts criticised that the structure of the curricula is not at all corresponding with the market needs. An attendant of the Austrian seminar sorely missed

a critical element in Leonie and asked whether we were taken in by the trends because trends and policies would be obviously adopted unthinkingly due to the fear of falling behind.

The fact that the majority of trends exists more or less in each country could mean that the surveys carried out on the European level were very much in correspondence with the national realities, but this could also mean – as some of the participants argued – that the trends pointed out by Leonie were too abstract and diffuse for leading to distinctive statements about the particular condition national and regional E&T systems are in. Also a general methodological critique on the Delphi survey design emerged. Especially the number of experts interviewed in several countries was considered to be insufficient. Of course, the Delphi survey was designed to address the European level, so the number of respondents per country does not matter that much since the experts were asked to assess the future development in **European** education and training.

ICT: Infrastructure supplement and the diffusion of new media

The main points of discussion in all the eight national seminars were ICT-related trends like:

- IT infrastructure: mobile, wireless broadband and interoperable networks;
- Increase of Internet-based materials and products for E&T;
- New learning materials e.g. interactive versions of text books and web-based educational tools for teachers and students;
- Diffusion of new media;
- New technological perspectives: ubiquitous computing and virtual reality.

As mentioned above, this is of course an essential part of the whole Leonie project because it is obviously a leading trend in European education and training. Initiatives for web-based education like e-Learning projects are under heavy development in learning systems across Europe.

Therefore, in many countries across Europe huge efforts have been made to supply schools, universities and other E&T-institutions with more and better ICT-infrastructure. That is to say that the views of some participants of the national Leonie seminars meet with relevant results of research conducted in this respect, which shows that teachers and learners are quite satisfied with the equipment provided. Although some researchers argued that their studies showed different results, namely a lack both in equipment and quality provisions. An interesting gap emerged in the assessment of ICT-related trends between researchers and administrators on the one hand (at least in Austria): administrators stressed that supplying educational institutions with ICT equipment has thrived whereas researchers objected that this has not yet progressed very far.

On the other hand, some participants argued that ICT-trends could also be rated quite low just because the trends regarding the ICT infrastructure are already gone past as the available hardware of E&T institutions is already satisfying. Anyway, what was sorely missing on the other hand – and there was a general agreement on this – is proper and suitable software to fill the available technology with adequate content and quality. Even in far developed technology countries like Finland, it was observed that web-based education is developing slowly, although a lot of resources are allocated to it.

Many participants argued that a lion's share of the products and programs put on the market under the label 'e-Learning' so far would be completely rubbish but they also conceded that E–Learning bears huge potential for the future. Of course – as it came out of the Delphi surveys – *quality of learning provisions is increasingly acknowledged as important* and the E&T experts that attended the national seminars agreed that this point is crucial but not at all reached yet. To achieve better quality, every endeavour must be made to develop e-Learning tools of higher value to bring e-Learning up from its infancy and therefore financial aid from public and private resources is needed.

The wrong way would be to merely equip E&T institutions with computers and hardware, only aiming at making education and training cheaper instead of making it more valuable. To prevent impersonalisation and provide permanent supervision and ongoing support by teachers, which was needed badly despite of even qualitative e-Learning tools, only a sensible integration

of e-Learning and traditional forms of learning could accomplish an enriched personal didactical setting. Teachers, students and learners should all benefit from ICT, instead of the industry-pushed technologies. But this seems to be the case at the moment because exogenous trends (deployment of technology) are far developed, whereas endogenous ones regarding the quality of ICT are still at the beginning.

For a fruitful integration of e-Learning services, a better training for teachers is inevitable. The development of qualitative e-Learning tools and well-skilled teachers who are able to cope with an adequate implementation of the emerging electronic devices and services may take time and financial resources in order to take full advantage of ICT in E&T.

Growing concern for cost-effectiveness of learning provisions
In all participating countries, there is a strong trend towards an increased need of validation and accreditation observable since quality assurance and evaluation of the output of schools, universities and other public E&T-institutions were big topics in the national seminars. *Quality of learning provisions increasingly important* was considered to be especially crucial in times of limited resources. Hence, quality becomes a decisive characteristic. Therefore evaluation will be more and more demanding since working life and learning will be integrated. The dilemma of quality/quantity as two increasingly polarised dimensions play a fundamental role in defining the future set-up of European educational systems.

Although some efforts in evaluation and quality assurance have been made in the past, a clear notion of consistent evaluation does not exist in Europe so far. It was argued that only cost-saving respects prevail: the whole topic is under the terms of minimising expenses from public budgets. Of course there are opportunities to cut down costs. For example in Finland – and this seems to be a problem not just there – a high number of universities and polytechnics give overlapping education, thus wasting resources. The different levels of education should be evaluated in order to reach a clear division of labour between the institutions.

However, a sufficient and comprehensive basic education for all, as well as higher education for as many people as possible requires adequate financial capacities. Many E&T experts argued that there is a potential decrease in the quality of higher education provision due to a chain reaction triggered by a decreased quality of primary and secondary education provision. This could result partly from a shift of resources from basic education to adult education, e.g. to employment training. This may cause a vicious circle in the future. If less and less resources are allocated to basic education, the education system will produce citizens with low-quality education. This means that later on, more and more resources must be allocated to their further education.

To prevent an erosion of public education, a public discussion about E&T seems necessary. For a cost benefit analysis it is inevitable to define the social goals and the purposes, for which education and training stands in a society. And if the conclusion is that well-educated people are of extreme value for a society with a prospering economy, it is up to the public authorities – in partnership with private corporations – to provide substantial financial resources. In some countries, public administrations withdraw from the commitment and the will for shaping the future of E&T.

Internationalisation: growth of international exchanges
Trends discussed at the seminars in this respect are listed below (in the order of the Delphi ranking):

● Internationalisation: growth of international exchanges and interdependence and increased competition on a global scale;

● Increasing number and variety of actors;

● Increasing competitiveness among educational institutions within and also outside the EU;

● Increasingly diversified social patterns;

● Diffusion of multiculturalism;

● Regionalisation: political pushes towards localism to counterbalance globalisation.

Internationalisation was rated as a strong trend in the Delphi surveys, but according to the national seminars, it has not yet developed very far in learning respects, although working life is increasingly multi-cultural. Enterprises are active all over the world and require technically and culturally skilled workforces. This puts external pressure to schools to educate and prepare pupils to be a part of a multi-cultural society. The increase of *highly diversified social patterns* seems to be a relatively recent but yet a strong trend affecting the educational systems all over Europe, leading to an *increasing number and variety of actors* in education and training. This process directly affects the social cohesion and causes social tensions because it leads to an *increasing competition among educational institutions within and also outside the EU.*

This also implies particular problems concerning access to E&T and the digital divide (see also paragraph below): some groups are kept systematically from education due to various constraints in social and mental respects. Unemployed persons, migrants, older or functionally illiterate people, minorities like the 'Romanies' in Hungary and others are barred from participating and playing an active role in the upcoming knowledge society. For example in Italy, it has been pointed out that lifelong learning mainly concerns those who already benefit from training opportunities. Disadvantaged groups are unable to acquire their share and benefit from new inventions in fast changing and highly interdependent western market economies, which demand well-educated and extremely flexible actors. On the other hand, it was also stated that ICT and the diffusion of new learning materials – at least in theory – could contribute to reducing social exclusion.

Regionalisation: political pushes towards localism to counterbalance globalisation were considered an important trend accompanying the processes of globalisation. Not only educational systems, also different regional characteristics like industry, learning patrimonies etc. play an important role in the development of regional identities (vs. the growing internationalisation). In European countries, regional issues are of particular importance. Capable education systems must therefore handle the needs both on the European level and on the level of a Europe of regions. Modern education systems must be able to deal with that fact and bridge the gaps that might occur if diverse interests come together. And, of course, in order to foster internationalisation and mobility in education and training, more courses and classes should be arranged in English to make it easier for foreign students to come to other countries. This is a trend and some countries offer already a diverse range of English-spoken courses by now, at least on university level, so exchange students can find many educational opportunities in the meantime.

Social inclusion

There seems to be an increasing influence, exogenous to the educational system, underlining values and interests oriented towards cultural and social issues that show a shift from dominant economic and technology-oriented interests to social interests. A critical outlook should be cast upon the *reduction in welfare provisions* and the *polarisation of incomes* in this respect. *Persisting high level of unemployment*, migration and poverty are important factors of these differences. A citizen's main cause for insecurity derives from strains in the labour market. A relatively pessimistic view emerged during the seminars about bringing excluded and deprived people back to education and training. In contrary it was expected that more money would be shifted even from the middle class to a knowledge elite (university of excellence) and that less money would be spent on disadvantaged groups, so leaping the *digital divide* is not in sight.

The tight economic situation after the boom years of the late nineties contributed to *reduced security of citizens and workers*, which had also a strong influence on the willingness of people to invest in education – if a workplace is secure, people are more likely to invest resources in their education and training. At the moment, certain stagnation could be observed and many European citizens prefer to be careful and thus they invest less.

Although the economy recovered recently, the high level of unemployment persisted and some participants stated that society has started to accept unemployment. Of course, this problem raises serious questions about the future of our society and how we will deal with excluded and disqualified people, whose share is obviously growing. Education plays a major role in these decisions since it could be used more effectively to enhance *access and social inclusion to E&T at national and European levels*. It was proposed, that more flexible ways to access education and training should be adopted to further enhance equal opportunities. Also new ways of sharing knowledge should be introduced.

A special problem is youth-unemployment, which is smashing in some countries of the European Union (in some European regions more than 40 per cent of people younger than 25 years of age are unemployed). This bears the *risk of 'skill gaps' between learners due to socio-economic differences* and reminds of the catchword 'lost generation'. Also in countries and regions with a lower rate of unemployment, fears and worries of the youth are increasing because they feel they are becoming redundant.

The same problem occurs with elderly people, who become also redundant with only 50 years of age (i.e. most of them do not get a new job if left without one) albeit they are willing to work and valuable due to their experience. An ageing society with its demographic development should benefit from the growing share of older people, who are still in a good condition physically and mentally.

Lifelong learning
Some participants stated that lifelong learning was more or less neglected in the Delphi surveys. Lifelong learning is a matter of time, especially for women and men who have care-allegiances. Hence, time and – another important pre-requisite for making the concept of Lifelong learning come true – financial resources are rare. Thus, one recommendation was to supply more people with higher education since well-educated people are rather willing to participate in further training. For this purpose, more financial aid and time resources are needed. Moreover, classes with a lower education level have to be supplied with extra care and suitable settings for their individual needs.

There is a continuous resistance against the concept of lifelong learning observable, because a holistic concept like this would require a rather dramatic change in the structure of educational systems. The inertia and slowness how these systems assimilate innovation and change is a well-known matter of fact. For example the German federal system with its different education systems where each federated state insists on doing its own thing. Up to now, it seems like the protection of well-established rights has won in many respects against the need to promote *initiatives aiming at making Lifelong Learning more attractive,* and this would require a dramatic structural change toward system unification and simplification.

Another point considered as crucial and relatively new was that learning should assume a sensitive component, i.e. making learning fun, otherwise learning would not become lifelong. What is missing in some countries – not just in this respect – was a political will to shape and foster lifelong learning.

The amount of older people will increase in the future and thus the majority of European learners will be elderly citizens. This will change the concept of learning. Education will be more and more learner driven, which increases the need for guidance. Moreover, education should be more learner-centred because education systems tend to force all learners into the same mould, which kills creativity. This type of system favours mediocre learners and puts talented persons aside.

Financial issues
A generalised lack of *public and private financial resources* is always the first thing to blame if things do not go the way they are supposed to. Of course, *slowdown of economic growth*, *evaluation* and a *growing concern for cost-effectiveness* in order to save public expenses are obviously important facts policy makers face and must deal with. It is easy to bring forward this argument, but there are also many other shortcomings in structural and social respects that resist change and adaptation.

A problem here, however, is insufficient public funding. If universities and other E&T institutions cannot cover their basic needs, private enterprises will not do it either because private investors normally like to cooperate (and spend money) with running and efficient educational institutions or help to bring up, for example, new research sectors in excellent universities or research facilities.

If basic equipment is missing, *private public partnership* is to fall through. For example German global players like Siemens invest in universities all over the world while they reduce their investment in German institutes due to strategic business reasons but also due to quality considerations.

In Greece, a *decrease of public funding into formal education* has not been reckoned as influential because investment in this area is a top priority in the national educational policy agenda. In Italy, inter-professional joint funds for continuous training have been introduced recently, managed by social partners of different economic sectors. These funds finance human resources development actions with the support of resources deriving from enterprises. It was stated in the Italian Validation report, that "there is now an agreement on the fact that investing in human resources, innovation and new technologies is fundamental for the recovery of Italian sluggish economy, negative demographic trends, and insufficient participation in lifelong learning."

According to the Finnish participants, basic education is in crisis; resources earmarked to it are diminishing because there has been a shift of resources to adult education (e.g. employment training). One must bear in mind that citizens also need skills and knowledge that do not necessarily present monetary value.

Flexibility

Flexibility or the ability of companies and employees to adapt rapidly to changes in market conditions and technology turned out to be an ambivalent trend: while enterprises and also some groups of learners (employees and future employees) are reckoned as being extremely flexible, the educational system and its components are perceived as very inflexible.

Deregulation or the removal of government-imposed restrictions or controls on the economy leaving the ground to market forces was considered controversial: some experts complained about the discrepancy in some countries that in order to rise flexibility, further norms are established. For example the German administration tries to achieve higher flexibility by imposing more rules and regulation. This 'regulation of flexibility' – not only a German phenomenon – thus impedes deregulation and is an example of an improper policy due to the rigidity of educational systems. It would be much more efficient to establish basic conditions which are constrained with as few rules and regulations as possible to accomplish an environment where public and private E&T institutions as well as enterprises can develop prosperous. On the other hand, the question to what extent market forces should be in control of E&T is of paramount importance. Leaving social issues up to *corporate social responsibility* would intensify conflicts and extremes and threaten basic provisions for all.

The trend *increased integration of formal and informal learning*, which was rated quite high by E&T experts on the European level (highest average rating of the proposed endogenous trends affecting education and training) was not perceived as being so strong by the participants of several national seminars. For example in Austria a formal degree is still very important, especially for admission in public service but also in private industry.

Change in this respect is not expected in the near future but it was stated that private industry is much more flexible, that is to say that formal degrees become less important if labour shortage occurs, which is – unfortunately – not the case at the moment. But also in other countries this trend was seen as being less influential.

Practical skills instead of theoretical ones needed

Up-to-date education should meet the requirements of working life. Therefore, the needs of society and industry must be taken into account when designing education, thus allowing the education sector to interact more with working life. This means that the role of a teacher should be redefined. Teachers have theoretical skills but practical know-how is missing. Tacit knowledge should be appreciated and evaluated in the education system.

There exists a gap between the labour markets demands and the workforce educational systems supply: too many graduate people without any professional experience enter the market, which needs more qualified workers who possess practical training and experience.

Other trends highlighted in particular countries

Some additional trends of change, which were brought up during the course of the seminars addressed the institutional context of learning and the structure of education systems, as well as issues regarding security, society and quality.

Institutional context of learning

- Too much bureaucracy and corporativism in the organization of education and lifelong learning (Italy, Germany);

- Expansion of second-chance schools and programmes (Greece);

- Administrative push (cost effectiveness in basic education) to mass-education (Hungary);

- Educational institutions have no or only little autonomy, therefore competition between them is not possible and the motivation for outstanding efforts is low (Germany).

Structure of education systems

- Shift of responsibility to parents and students, which demands too much from them (Austria, Finland);

- Bad mood of teachers and trainers is rising (Austria);

- New ways of sharing knowledge should be adopted. The basic problem of the Finns is that they have a tendency to sit on the information (Finland);

- The structure of the curricula is not corresponding with the market needs (Romania);

- Increased personal responsibility of learning (Greece).

Social issues

- Changes in the family system, changes in beliefs and ways of life (Spain);

- Transferring values: Values are still important in every kind of education and training (Hungary).

Security issues

- Increase of violence in schools (Spain);

- Uncertainty is the prevailing phenomenon in the society and creates different kinds of substitutes: religion, ethicality and security are interesting indicators of this phenomenon (Finland).

Quality issues

- Evaluation and increased accountability across the systems (Italy);

- Potential decrease of the quality of higher education provision due to a chain reaction resulting from the a decreased quality of the primary and secondary education provision (Romania).

5.2.2 Weak Signal Survey: Events yet under the Surface

The Leonie project carried out also a Weak signal survey in order to collect more detailed opinions about national and international evolution of learning in Europe. The Weak signal method as a bottom-up forecast survey is targeted to specialised 'communities of practice' and their practice-based or procedural knowledge and culturally defined 'life worlds' (learners, parents etc.). Weak signals are events that are under the surface, overlooked, but that may be a sign of major evolutions. Most planning approaches, however, fail to perceive or record such signals or dismiss them because typical evaluation techniques support only strong trends.

The weak signal survey was not a big deal in the discussions of the national seminars albeit the results were presented to the audiences, because the discussions were so dense that time ran out too fast, leaving no time to delve into the Weak signals. But there were at least some statements: One reaction on the Weak Signals Report was that it was far too optimistic – for many experts, the signals were rather visions or 'how I'd like to have the future' than grounded and reality-based views of the world. Nevertheless, many of the collected strong and rather strong signals were well known (one participant said "we know these signals for 20 years").

Some participants showed interest in the Weak signals as a research methodology. They commented that it is a very original survey method and that the strong signals cover rather mainstream aspects and neo-liberal tendencies whereas the weak signals imply a more critical approach concerning E&T.

However, some experts mentioned that the Weak signal method could have been more realistic since it represents the forecasts and the scenarios of the practitioners and of people with a more practical experience in the educational reality.

5.3 Policies Shaping the Future of European E&T

The idea behind the way how the Leonie Delphi surveys gather opinions about current and upcoming policy-priorities across Europe was the following: Delphi experts were asked to assess 10 given policies in consideration of their appropriateness and likelihood **on the European level** within the next decade. In the first Delphi round, the experts were also asked to specify other policies, which they identify or reckon to come up. Ten more policies were brought up during the surveys this way.

Again the tenor at the national seminars was that the 20 proposed policies put forward by Leonie cover a good spectrum of strategies. But each single policy has aspects which could be assessed both as more and less appropriate, because one can read it in a positive as well as a negative way and each policy bears chances and risks at the same time.

Moreover, the 10 policies proposed by the Leonie Team in the first questionnaire were regarded, as being on a very abstract level whereas the 10 policies brought in by Delphi-respondents were more specific, so comparing them was perceived difficult. It was also stated that the given policies were very much oriented towards EU policies and not at all towards the whole of Europe. Generally, the given policies were specified as being not very useful for policy-makers, because they would remain too abstract and also their status would be dubious.

5.3.1 Opinions about current Policy Strategies across Europe

Just like the Delphi respondents, the E&T experts who attended the national seminars were asked to assess each given policy in terms of its appropriateness and likelihood. It was of particular interest during these discussions whether the rating national experts put upon a particular policy was in divergence from or convergence to the Delphi outcomes.

- *Initiatives aimed at stimulating the use of ICT for learning* purposes are an important policy and were identified by all seminar attendees although it was considered controversial. Some experts assessed this policy as being less appropriate than the Delphi respondents thought it was. Nevertheless there was consensus that more and more resources will be allocated to electronic education, so it was consistently expected that this policy would play a major role in Europe further on.

Promoting investment in Research & Development (R&D) was rated with the highest appropriateness by Delphi respondents and so did the national experts although many of them argued that they recognise a decrease of investment in many areas of science.

- As described before, *actions aimed at increasing quality and evaluation practices at all levels* have become of particular importance. Policy makers are bound to refer to these crucial questions and nearly all recently introduced policies are more or less concerned about quality and evaluation. Several participants warned that the results of an 'evaluation' often lead to nothing else than *strategies in order to reduce cost per unit thus increasing productivity of education*, which was seen as very likely but not appropriate at all. Because if productivity is understood as cost per unit, the question remains how this could be measured appropriately.

- *Policies aimed at broadening access to learning provisions for all* in combination with *Strategies aimed at making lifelong learning and teaching more attractive* and *2nd chance programmes etc. linking formal and non formal education* were

assessed with a high appropriateness by the participants but they were perceived as being less likely, so such policies were not really identified so far.

- *Concerted strategies related to the integration of systems* would be very helpful and welcome but although some efforts already had been made in this respect, a real integration of systems is a dream for the future in European E&T systems.

- *Improving training for teachers, tutors, trainers and education stakeholders* is regarded as particularly important in an ICT-based learning environment and for raising quality. There remains a lot of work in this respect too.

- *Shifting financial support from supply to demand:* Some participants called for encouragement of individuals instead of institutions to get rid of the strong preference for the middle class. In this context, the emergence of Non-Profit Organisations (NPOs) and private providers in E&T should be discussed in terms of innovation, so there was a call for fostering and *encouraging the emergence and consolidation of not for profit E&T providers*.

- *Developing entrepreneurship through education and training* is a weak point in many European countries and more incentives for developing entrepreneurship are urgently needed.

5.3.2 Shaping the Future of European E&T: favoured Policy Strategies

The expectations about upcoming policy-priorities in the participating countries were expressed in a very reserved manner, although European E&T systems are in a state of flux and a lot of reform projects are to be implemented (see also paragraph below). For example, the whole Italian formal education system has been changed recently: a major reform of the entire education and training system is in progress, aiming at curricula innovation, the improvement and integration of learning in schools, universities and regional training institutions in order to respond to changing social and economic demands for knowledge, skills and qualifications, the introduction of new pedagogic formulas into formal education such as a competences portfolio and tutors.

Some participants argued that there were no clear-cut strategies recognisable despite the reform-rhetoric of the governments. So the experts themselves put forward several policies, which they would appreciate to be implemented over the next few years. These proposed policy strategies should meet the following characteristics in political/institutional and pedagogical respects:

Political/institutional context of learning

- There must be a quick solution to the public-private debate in order to find enough consensus to confront the main challenges in the educational system;

- Forcing investment in Human Resources;

- Free structural change from ideological taboos (increase transmissibility and accountability between different types of schools, apprenticeship, etc);

- Political will for changing structures regarding the learning society: reinforcement of the possibility of policy design and functional interconnection of policy-structures aiming at their collaboration and integration;

- Developing ties between school and society: the link of culture and education is of particular importance; finding a solution to social problems like the socialisation of immigrants and the inclusion of minorities, religious frictions, demographic and security issues is a basic condition for keeping the social cohesion of the European social model (if there is one).

Pedagogical setting

- Improvement of learning: establishing a minimum level of competencies for all;

- Flexible response to the diversity of individual, local and enterprise needs and to utilise more effectively the available funds and technologies;

- Stronger orientation to outcomes with permanent feedback to the development process, quality assurance and evaluation: for example, ensure and enhance the efficiency of the pedagogical setting to raise the number of graduates;

● System change from selection towards encouragement;

● Instead of dedicating to the technology-related policy so much attention, some attendees thought stimulating public discussion about E&T would be of greater use, just like forcing better skills in foreign languages. Moreover, mobility should be enhanced, and similarly more incentives for developing entrepreneurship should be initiated.

6. CORE TENSIONS IN EUROPEAN LEARNING SYSTEMS

Relying on the rich research basis gained through the conduction of two surveys and the validation through national seminars, the LEONIE consortium intended also to develop a framework for the analysis of the evolution of learning systems which could take into account the following issues:

● The future of learning is not taking place in a vacuum, but some aspects of the future can be influenced and shaped by social actors. Developing scenarios and visions of the future helps individuals and organizations to 'create' their own 'learning future'.

● The future of education and training in Europe will not be unidirectional, as the Delphi and the Weak signal surveys demonstrate. Nevertheless, its complexity can be better seized if one could position alternative/complementary visions of it on the continuum of core tensions-dilemmas-polarities that push future learning in different (often approximately opposite) directions. Framing these visions, as 'tensions' is useful because they involve institutions in seemingly mutually exclusive choices-, *both* of which must be taken into consideration- about where they should be heading. Relying on the research activities carried out, the LEONIE consortium has been able to spot those issues considered as fundamental by respondents in the form of core tensions.

● Tensions are not necessarily antithetical. Future learning could advance in both directions, in one of the directions proposed or in none of them, according to the sector of education and training taken into consideration, the country, the time span, the particular intertwining between exogenous and endogenous trends. In fact we suggest that both directions of a tension are 'positive' ends to be pursued, and that the original combination of false opposites is one of the real challenges of policies and practices in this field (e.g. as far as the tension 'access/excellence' is concerned, excellent learners who receive special support might provide peer support to disadvantaged colleagues and-while exemplifying socially aware use of excellence, reduce the need of professional support for learners and related costs). Therefore, both terms of the tensions are needed in future learning systems, and this is not to be intended as mediation, but rather as a new and more comprehensive vision of the evolution of learning systems.

● New technologies will play a fundamental role in everyday life as well as in learning systems. The participants in the LEONIE research activities have reckoned them as extremely influential in shaping future education. However, none of the tensions proposed refer directly to information technologies. They have to be considered a highly influential horizontal contextual factor (such as for instance, the demographic revolution) and an important means and facilitator of the development of future learning systems. The choices of learners, learning facilitators, researchers and policy makers in the use of ICT will determine the directions of development of learning systems, not ICT as such.

The identification of tensions or 'critical uncertainties[30] **might serve manifold purposes:**

● Spur educational research, in line with the activity of broadly acknowledged international observatories of education such as OECD, which has also identified core dilemmas in its research activity on education[31];

● Reducing the complexity of multi-faceted evolutions while avoiding simplistic and unidirectional visions of the future;

● Providing a platform for debates among stakeholders which are often characterized by conflicting interests;

● Encouraging individuals and organizations to position themselves with regard to core issues for the future and develop a predictive capacity and a transformative approach; the following chapters of this report will elaborate more on this issue.

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[30] See Lawrence Wilkinson 'How to build scenario'; http://hotwired.wired.com/
[31] See, for instance, OECD 'Education Policy Analysis', Paris, 2004

Every term of the 'false dichotomies' or tensions presented below is, and is likely to be, a buzzword in the debate about education and training. Every term presented is rich in semantic connotations since it has been among the most frequently used expressions to describe several and heterogeneous trends. And yet most of the terminology adopted is rarely defined. Every term should be intended as an *ideal type,* according to the definition provided by the sociologist *Max Weber*[32]: it is a conceptualisation of a set of trends and forces of change, formed by the synthesis of many diffuse, discrete, more or less present and occasionally absent concrete individual phenomena, which are arranged into a unified analytical construct.

This mental construct, in its conceptual purity, cannot be found empirically anywhere in reality. Once, however, an ideal type is formed, it offers the researcher with a tool with which a real situation or action can be compared. Thus it is like a 'yard stick' to fathom reality. In our case the 'real' future will contain elements of all of the tensions and probably will develop also around new dialectics, and yet those tensions identified could serve to measure and spot latent or more evident dynamics of evolution.

The following paragraph constitutes an attempt to provide a definition of the tensions identified by the LEONIE consortium. In some cases the definitions refer mainly to a specific dimension of education and training (e.g. generalisation/specialisation refers mainly to curricular structure).

The tensions presented below reflect the most recurrent answers of the respondents as far as critical uncertainties for future learning are concerned. A set of coherent answers and similar formulations have been clustered in order to obtain a synthetic list of core tensions, which is presented below:

1. Convergence vs. Context;
2. Continuity vs. Experimentalism;
3. Access vs. Excellence (Quantity vs. Quality);
4. Market Dynamics vs. Public Good Values;
5. Generalisation vs. Specialisation;
6. Information vs. Knowledge;
7. Individualisation vs. Socialisation of Learning;
8. EncouragingTraditional Providers vs. Bringing New Actors to drive Innovation in E&T;
9. More Investment vs. More Efficiency;
10. Focus on Young People vs. Re-directing Resources to Adult Learners.

All the tensions are associated with a list of relevant trends/policies /signals which have been rated-and in many cases suggested-by the participants of the LEONIE research activity. For every trend, policy or signal a general indication of its rating (high, medium, low) is provided, in accordance with the results of the LEONIE surveys carried out.

6.1   Convergence vs. Context

Convergence and contextualisation are multi-dimensional phenomena[33]. One common notion has conceived convergence in terms of *internationalisation*. On these lines, 'convergence' of education designates a growth of international exchange and interdependence. It refers to a tendency to the creation of a 'global education sphere' though increasing networking initiatives among learning providers worldwide and the networking power of new technologies.

On the other hand, learning systems are still considerably influenced by nation states and vary considerably according to the sector considered. This variety implies the necessity to consider, respect and build on the distal and proximal forces or, in other words, learning patrimonies[34], that surround learning experiences.

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[32] See Max Weber in 'Economy and society' 1922
[33] David Held and Tony McGrew (1996) Globalization: A Critical Introduction, Macmillan
[34] For the concept of "learning patrimony" see the report 'Technologies for the Knowledge Society & Lifelong Learning - Key Findings and Suggestions for Action';
      http://www.education-observatories.net/pole/reports_html

Convergence has been also equated with *universalisation*. In this usage, 'global' means 'worldwide', and 'convergence' could be understood as the process of spreading the same values (in particular western values) worldwide. Contextualisation in this respect could correspond to the valorisation of different values into education (e.g. in view of a multiethnic society).

Finally, convergence is identified as *deterritorialisation.* The myth of learning taking place anytime anywhere has been overshadowed over recent years by the importance of making learning happen within culturally rich social environments. In fact, there is a growing emphasis on locally determined curricula in education and training (i.e. minority languages entering into formal education).

Tensions between the local, the regional or the global will come increasingly to the fore in the coming years and it will be part of the tasks of learning systems to mitigate them. An expression of the dilemma convergence/contextualisation is, especially for large scale learning providers, the search to be bodies of global importance while also serving national or local needs.

The dichotomy convergence-context can be explained also with regard to EU policies in the field of education and training. In this area, EU activities are centred on coordination with little or no 'classic' legislation. In fact, education and training systems touch closely on national identity or culture, and national arrangements are very diverse; here the European homologation is clearly inappropriate[35].

Nevertheless, a European policy for education, aimed at increasing coordination among member states has been pursued over the last two years and it is likely to be carried out in the future. After the first attempts in the 80s' to promote mobility through the Erasmus programme, the Maastricht Treaty offers limited but significant support for EU action in this field. Following the Bologna declaration, one of European policy objectives in the field of education and training is the establishment, by 2010, of a European Space for Higher Education, i.e. a common space in Europe where students, professors and researchers will be able to move without borders. The same applies to Vocational training (the so-called Bruges-Copenhagen process). Will this bring more convergence to E&T systems? Or, while responding to powerful general trends, E&T systems remain highly distinctive, with no obvious movement towards a single common pattern (taking also into consideration the fact that there is a new emphasis on decentralisation and self-direction of E&T instututes).

In any case, not only deliberate choices of policy-makers will steer the development of learning systems towards greater divergence or convergence: it has to be considered that learning systems are featured by a growing number of actors into a growing number of learning arenas with significant implications on their direction -or directions- of evolution.

Relevant trends/policies/signals
- Policies aimed at consolidating the European dimension of education (rated high);
- Global standardisation of learning services (rated high);
- Increasing Local/national/international networking initiatives (rated high);
- Internationalisation: growth of international exchanges (rated high);
- Increasing Local/national/international networking initiatives (rated high);
- IT infrastructure: mobile, wireless broadband networks (rated high);
- Policies related to the integration of systems: education-training, education-labour market-broader society, formal and informal learning (rated medium);
- Multiplication of learning occasions/spaces (rated medium);
- Global standardization of learning services (rated medium);
- Personalisation of learning provisions (rated medium);

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[35] See, on this issue, the report of the European Commission working group 'assessing the convergence processes for national policies'; http://europa.eu.int/comm/governance/areas/group8/report_en.pdf

● Diffusion of multiculturalism (rated low);

● Regionalisation: pushes towards localism (rated low).

6.2 Continuity vs. Experimentalism

Continuity could be defined, as "the resistance of education and training systems to change in any of the directions towards which innovation programmes and market forces would tend to push is the characterising element"[36]. Continuity could be the result of 'protectionist' public policies that prevent private and generally new actors from interfering in formal provision of education and training (closed accreditation systems, emphasis on formal titles to access public administration, etc.) or as a failure in the implementation of innovation policies, or from the internal resistance to change of E&T actors.

On the opposite side there is pro-activity or experimentalism that could be defined as follows: a pro-active/experimentalist organisation or learning system operates on the basis of 'Foresight Management', anticipating rather than merely responding to change. Such a focus will turn what may appear to many to be a potentially dangerous challenge, into an opportunity. More on this dichotomy can be found in the next chapter.

Relevant trends/policies/signals:

● Rise of knowledge society (rated high);

● Diffusion of internet-based learning materials (rated high);

● Multiplication of learning occasions/spaces (rated medium);

● Resistance to change (rating low).

6.3 Access vs. Excellence (Quantity vs. Quality)

When public budgets are constrained, is there a trade-off between the promotion of excellence learning and the establishment of learning provisions in which 'all learners can thrive regardless of gender, ethnicity, class, age, sexuality, cognitive and/or physical abilities'[37]?

A possible answer is that learning systems will develop mainly in centres of excellence, core European cities, and learning regions and will become less accessible/affordable for peripheral areas/groups. In an alternative scenario, access to learning provisions will be more and more generalised, with implications on educational quality (not easy to foresee). Yet another possibility is the development of both at the same time, separately or in an integrated way.

Implicit in the dilemma access-excellence is the dilemma quality vs. quantity within a learning system. One can consider the latter dilemma as a reformulation in a broader perspective of the former. Does greater 'quantity' in learning systems (more enrolments, more players involved, more learning spaces and options) come at the expense of educational quality? Traditional educational models had emphasized small classrooms where the exchange of wisdom and ideas took place. Unfortunately, this model was expensive and now can only be practiced at a few relatively elite institutions. One could also argue that some implicit risk of self-referentiality of small groups is also intrinsic to this model, not very exposed to change in society.

Most institutions, therefore, migrated to the high-volume model of large lectures and decentralized content delivery. An issue for the future of learning systems will indeed be the balance of these equally important policy objectives.

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[36] See 'L-Change-European Observatory on IST Related Change in Learning Systems IST-2000-26226' Scenario and Forecast Report
[37] Definition of 'inclusive learning environment'; http://www.nald.ca/CANORG/herod/glossary.htm

Relevant trends/policies/signals:

- The standards and the quality of learning will raise (rated high);

- Policies aimed at broadening access to learning provisions for all (rated high);

- Policies aimed at increasing quality and evaluation practices at all levels (rated high);

- Lifelong learning will become possible for everybody (rated high);

- Performance assessment will become the norm (rated high);

- Improving training for teachers, tutors, trainers and education stakeholders (rated high);

- Gap between well educated and poorly educated increases (rated high);

- Increasing importance of evaluation of learning (rated medium).

6.4   Market Dynamics vs. Public Good Values

The introduction of market mechanisms into an educational process has forced governments to reduce their control over education. In this 'vacuum', the massive entry of the private sector actors and market paradigms into E&T took place over the last decades, determining a push towards de-institutionalisation and 'marketisation' of education and training. The consequences are manifold:

- A vast number of learning opportunities and choices are no longer supported and mediated very substantially by the conventional education and training organizations;

- "E&T institutions have become sites for branding and the targets of corporate expansion"[38];

- Learners are increasingly perceived as consumers;

- Traditional learning providers not only have to "compete more and more with each other but also with virtual and commercial organizations and companies, all offering the same type of courses."[39];

- Nevertheless, there are counter-forces in action[40]. The Prague Communiqué made by European Ministers of education[41] supports the idea that higher education should be considered a public good and that it is and will remain a public responsibility. In economic terms a public good is generally defined as a good that exists not for mere utilitarian purpose, since it is directed to the fulfilment of societal needs that cannot be dealt with solely by the market[42]. The question how well learning provision, in the context of declining public subsidies and increased globalisation, is serving as a public good is an open issue for the present and the future of learning systems.

Relevant trends/policies/signals

- Encouraging the emergence and consolidation of private Education & Training providers (rated high);

- Increasing marketisation of education (rated high);

- Increasing competitiveness among educational institutions within/outside the EU (rated high);

- Developing entrepreneurship through education and training (rated medium);

- Diffusion of business-oriented models into E&T institutes (rated medium);

- Increasing public-private partnerships in E&T (rated medium);

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38 Globalisation and the incorporation of education, encyclopaedia of informal education; http://www.infed.org/biblio/globalization_and_education.htm
39 Trends in eLearning: indicators of change; http://www.ub.es/euelearning/
40 See, on this issue, "Education: Public or Private Goods?" Michael Lorenzen; http://www.libraryreference.org/publicgoods.html
41 URL: http://www.eurashe.be/info/Prague_communique.PDF
42 See the glossary of economics Stiglitz-Walsh; http://www.wwnorton.com/stiglitzwalsh/economics/glossary.htm

- Encouraging the emergence and consolidation of not-for-profit Education & Training providers (rated low);
- Decrease of public funding in formal education (rated low).

6.5   Generalisation vs. Specialisation

This dichotomy relates mainly to curricular structure. Curriculum structure and design is a vehicle to shape the learning system. Generalisation could be intended both as "the carryover of skills, or concepts from one setting or task to another"[43], or as the pedagogic design intended "to provide breadth to the curriculum and a common experience for all the students. It is usually defined on an institution-wide basis and involves study in several subject areas."[44]

On the other hand, growing differentiation of social spheres, increased competition among E&T providers to find their 'market niche' and emerging demands of the labour market have lead, and in the future could lead even more, E&T providers to increased specialisation of their learning provisions.

This means that curricula are designed with the purpose to support learning in achieving a sound understanding about a specific and circumscribed discipline. This has relevant implications on pedagogic methods, teachers' training, and also on the organisation of learning provisions: E&T providers which endorse specialised curricula have usually a compartmentalised structure and operate in the form of autonomous substructures.[45]

Relevant trends/policies/signals

- Learning skills increasingly important (rated high);
- Emphasis on meta-skills (rated high);
- Stimulate the participation to scientific and technical studies (rated high);
- Shifting in education from generalisation to specialisation (rated low);
- Increasing personalisation of learning provisions (rated medium);
- New competence model focused on basic skills (rated medium).

6.6   Information vs. Knowledge

The acceleration of change, the increasing complexity of social spheres, the emergence of new media complementary to the traditional mass media (Radio, TV, books) that features contemporary societies are accompanied by an increase in the information needed to keep up with all these developments. The resulting overflow of stimuli and information[46] for individuals makes it difficult to memorise, deepen, analyse, and synthesise them, thus evoking the risk of "weak alphabetisation"[47].

In order to cope with information overload, which Shenk (1997) has called "data smog", learning will be more and more an activity of knowledge management; learners will have to learn how to deal with complexity. Accordingly the management of organised, retrievable, 'metabolised' information will more and more feature knowledge in the 21st century. A new generation of 'Google learners', no more hetero-directed by teachers, but supported by learning facilitators, will need to be able to 'see the forest through the trees' taking advantage of user-friendly technologies. Their learning paths will be centred on their capacity to create islands of sense. Similar considerations could be done for organisations.

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[43] Educational Psychology: Theory and Practice glossary; http://www.abacon.com/slavin/glossary.html
[44] Glossary of United States Educational Terminology; http://www.uta.fi/FAST/US5/REF/glossary.html
[45] See 'Three dialectics in higher education future' Peter Ewell, 2003 Project on the Future of Higher Education; http://www.pfhe.org
[46] See 'Change and Information Overload: negative effects' F. Heylighen, 1999; http://pespmc1.vub.ac.be/CHINNEG.html
[47] See Frabboni, "Introduzione alla pedagogia generale", Laterza 2003

Relevant trends/policies/signals

- Rise of knowledge society (rated high);

- Shift towards a learner-centred paradigm (rated high);

- Continuous information management for the individual (rated high);

- Facilitated access to information (rated high).

6.7   Individualisation vs. Socialisation of Learning

The possibilities of learners to interact with others, both virtually and physically, could grow thanks to new technologies (any place any time possibilities to interact) and the rise of new forms of communities and engagement in civic and social life both for learning purposes and as an arena of non-formal and informal learning. Sociologists and educational theorists foresee, for instance, the development of "values-oriented learning communities"[48] or "local learning hubs"[49]. This is one possibility.

On the other hand societal trends such as growing fears of diversity (due to terrorism, non-acceptance of multiculturalism…) and lack of universally accepted visions of the world could lead individuals to retreat into their private world[50], thus making learning an experience more and more insulated or limited to its own restricted social sphere or community of practice.

Relevant trends/policies/signals

- Policies aimed at stimulating the use of ICT for learning purpose (rated high);

- Diffusion of new media (rated high);

- Increasing local/national/international networking initiatives (rated high);

- Growing importance of social skills (rated medium);

- Networking through the web becoming a community power (rated medium);

- Collaborative/peer-to-peer learning expected to spread (rated medium);

- Less face-to-face communication (rated low).

6.8   Encourage Traditional Providers vs. Bringing New Actors to drive Innovation in E&T

The number of formal and informal education agencies/learning spaces has risen dramatically over the recent years. Learning spaces are now virtual and real, self-managed and/or collaborative, public/private and personalised. One of the consequences, mentioned above, is that a vast number of learning opportunities and choices are no longer supported and mediated very substantially by the conventional education and training organizations. New actors are gaining ground as learning providers. This is both a consequence and a cause of lifelong learning and transparency of competence policies and practices.

But the entry of new actors into formal education and training institutions has to be intended not only as new learning providers joining the 'learning supermarket': new actors are also families, local authorities, NGOs since the needs of these stakeholders are more and more taken into account in the formal education and training world. New actors are also segments of populations, especially adult and older, getting back to education and training.

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[48] See 'Education at the Cross Roads: the Futures of Schooling' reference as above
[49] 'Entry Point to Twenty First Century Learning A Call for Action at the Local and Global level' Seymour Papert, David Cavallo, Future of learning group, MIT media laboratory; http://learning.media.mit.edu/learninghub.html
[50] See C. Lasch "The Culture of Narcissism. American Life in an Age of Diminishing Expectation"

An open issue for the future, in this respect, is whether traditional E&T providers will be increasingly marginalized or rooted in the society: this depends to a certain extent on their capability to avoid being self-referential and to establish a dialogue and a common ground with new actors described above.

Relevant trends/policies/signals

- Encouraging the emergence and consolidation of private Education & Training providers (rated high);

- Increasing number and variety of actors in E&T (rated high);

- Encouraging the emergence and consolidation of not-for-profit Education & Training providers (rated medium);

- Multiplication of learning occasions/spaces (rated medium);

- Loss of central role of school in transmitting culture (rated medium);

- Formal education increasingly open to stakeholders (rated low).

6.9   More Investment vs. More Efficiency

Over the recent years, in line with the Lisbon process, there has been a considerable emphasis on the issue of raising investment in human resources. 'Although the EU Member States, like the USA, spend just over 5% of their GDP on publicly funded education and training, there is still a clear deficit in private funding. While private sources have always been regarded as an addition to, rather than a substitute for, public funding in the European social model, an increase in private funding is necessary in view of the new challenges of globalisation.'[51].

But the call to raise investment (public and private) in education and training is being more and more associated with a pressure to diversify funding sources and an increasing attention on rationalisation, performance measurement on "how investment in education and training is targeted and measured"[52] implying the importance of promoting cost-effectiveness of education and training provisions. It is worth to mention that this tension is reported as a key dilemma in the education policy analysis carried out by OECD in 2004[53].

Relevant trends/policies/signals

- Growing concern for cost-effectiveness of learning provisions (rated high);

- Promoting investment in Research and Development (rated high);

- Policies aimed at increasing productivity of education (rated high);

- Reduction in welfare provisions (rated high);

- Increasing allocation of resources for ICT integration in learning provisions (rated high);

- Improving training for teachers, tutors, trainers and education stakeholders (rated high);

- Policies aimed at making lifelong learning more attractive (rated high);

- Policies aimed at making the teaching profession more attractive (rated medium);

- Investment on guidance and support services on the rise (rated medium);

- Decreasing of public funding in formal education (rated medium).

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[51] See the communication from the Commission 'Investing efficiently in education and training: an imperative for Europe' Brussels, 10.01.2003 COM(2002) 779 final;
http://europa.eu.int/eur-lex/en/ com/cnc/2002/com2002_0779en01.pdf
See also Concrete future objectives of education systems; http://europa.eu.int/scadplus/leg/en/cha/c11049.htm
[52] See above
[53] OECD, 'Education Policy Analysis', Paris, 2004

6.10 Focus on Young People vs. Re-directing Resources to Adult Learners

In times of marginal increase or even reduction of public investment in education and training, the issue of investment in young or adult education is extremely controversial, and will be even more so in the future. Those who are in favour of raising investment in adult education argue that Europe, due to radical demographic change, will grow older. We will have more and more adults in the European society, and proportionally less youth. As the older and more politically active generations retire, they will request for additional support for their long years of retirement. Moreover, learning provisions for adults are rarely above 5% of public expenditure in E&T in European Countries. Accordingly, this will create a major force pulling the financing towards adult learning.

And those who are in favour of privileged investment in young education argue that the return on investment in adult education is small, since the productive life span after the investment is short. Moreover, when public budgets are constrained, increasing the investment in adult education might mean a reduction in investment in young education. The point is also made in these terms: most of the present 'unwillingness to learn' of the majority of adults is the result of bad experiences in their early years of schooling, so priority should be given to change school education in order to create autonomous lifelong learners.

Relevant trends/policies/signals

- Policies aimed at making lifelong learning more attractive (rated high);
- Learning and training will become Lifelong human activities (rated high);
- Policies to promote employment and employee up-skilling for the knowledge society (rated medium);
- Increasing access to E&T by new segments of population (rated medium);
- Shifting resources from young people education to adult learning (rated low);
- 2nd-chance programmes etc. linking formal and non-formal education (rated low).

7. LOOKING AT INDICATORS

7.1 Introduction: Basic Approach to formulating Indicators

In evaluation studies, indicators are used as evidence or signs by which we can assess or evaluate certain types of materials, methods, a policy intervention, a programme or a project. Indicators are 'measuring devices'; they help quantify the current status of affairs in terms of the measurements and the data, which is possible to collect and analyze. They encompass the kind of data to be collected and the time intervals for the collection.

LEONIE is aiming "to build and validate a series of indicators that will allow comparisons in time and between countries, of change processes affecting education and training". In brief, the LEONIE project should identify suitable indicators, more focused on qualitative aspects and on results. In order to be useful in practice, these indicators will need to be related, as closely as possible, to the decision-making process; then they will have to be collected systematically in time and place, so as to allow monitoring and comparisons; and finally they must be relevant to people who are aware of all the corresponding dimensions of context differentiation, in economic, demographic, institutional and cultural terms. In defining these indicators, an overall perspective will be adopted, in order to support the decision-making process of public authorities (at European, national, regional, local levels), as well as education and training organisations and research planners.

To develop good indicators, it is necessary first to have a clear view of what it is aimed to achieve and to measure. The first requirement for a systematic development of indicators is to identify the results, objectives, outputs and key concepts of their application.

The basic approach involves four steps:
- Identify what is to be measured;
- Develop trial measures;
- Assess each trial indicator, utilizing agreed-on criteria;
- Select the best indicators for specific tasks/aims.

7.2 List of relevant Indicators

The LEONIE project has set up a working group dealing with indicators and operating in collaboration with the rest of the partners, in order to provide a contribution to the current debate on the identification of the factors and the drivers that influence the trends in European education and training systems, taking into consideration that the concrete future objectives for education and training in 2010 as defined by the European Council also foresee a series of indicators.

After a consultation process on the areas to be investigated and on the relevant drivers and factors, this document aims to identify indicators to measure the major drivers of change, which affect the present and future development of education and training. Being aware of the complexity of this foresight exercise and the risk of pitfalls while thinking about future and elaborating visions, scenarios and forecasts, the LEONIE consortium intended to analyse the evolution of learning systems by making a series of assumptions.

The future of education in Europe will not be unidirectional but its complexity can be better comprehended if one could position alternative/complementary visions of it on the continuum of core tensions-dilemmas-polarities that push future learning in different directions. These visions could be framed as 'polarities', since they involve institutions. This consultation process will lead to build and validate a series of indicators that will allow comparisons in time and between countries, of change processes affecting education and training in view of establishing a capacity to forecast the likely evolution of education and training in Europe.

Polarities are not necessarily opposing. Future learning could advance in both directions, in each of the direction proposed or in none of them according to the field and sector of E&T we refer to, the structure and the priorities of national E&T systems, the time span, and the particular intertwining between endogenous and exogenous trends.

The conclusions of the Lisbon and Feira European Councils stressed the importance of ICT in a knowledge society, and its impact on transforming learning systems and processes. The evolution since then has confirmed this essential role of ICT, but the emphasis has moved from equipment and connection to the Internet (considered as prerequisites) to the overall pedagogical context. New technologies play a fundamental role in the everyday life as well as in learning systems. The participants in the LEONIE research activities have reckoned them as extremely influential in shaping future education. However, none of the polarities proposed refer directly to information technologies. Nevertheless, this does not diminish their importance. They have to be considered a very influential contextual factor and an important means and facilitator of the development of future learning systems. The choices of learners, learning facilitators, researchers and policy makers in the use of ICT will determine the directions of development of learning systems, not ICT as such.

Framing future development in the form of policy tensions has allowed the LEONIE consortium to structure along these lines a non-exhaustive list of possible indicators to monitor change processes over time. The following table summarizes the most relevant and important indicators identified by the participants of LEONIE research activities, associated with the elaborated polarities. For each indicator, the data sources, the frequency of data collection and the level of the source's reliability are provided.

The indication of *reliability* corresponds to the actual or estimated level of data reliability through a 5-point rating scale from low=1, medium=3 to high=5 based on the criteria of internal and external validity and related risk factor concepts.

Table 14: Core Tensions & Indicators

Tensions	Indicators	Source	Frequency	Reliability
Convergence vs. Context	1) Legal framework in EU countries regarding 'transferability' of degrees and courses (toward a EU Higher Education Area)	1) National Law sources		4
	2) Mobility of students, Europe-wide	2) Eurydice	Annual (all)	4
	3) ECDL growth rates (and absolute numbers)	3) ECDL Foundation		4
	4) ICT 'diffusion'/adaptation rates in EU countries	4) Eurostat		4
	5) 'Digital divide' spread	5) Eurostat		4
Globalization vs. 'Staying within national borders'[54]	1) Number of pupils and students (up to 29 yrs old) learning foreign languages (English etc.)	1) Eurostat - New Cronos, Eurydice		4-5
	2) Number of EU universities/educ-institutions which have joint-programs (and students from) with other European universities/educ-institutions	2) Media advertisements, EC-funded projects (www.cordis.lu), Eurydice	Annual (all)	3-4
	3) Number of EU universities/educ-institutions which have joint-programs (and students from) with US, Japan, Australia, China, India, Latin America and SE Asia universities/educ-institutions.	3) Media advertisements, Financial Times Business Education sections		3
	4) Mobility of students among EU countries, and globally	4) Eurydice		4-5
Access vs. Excellence (Quantity vs. Quality)	1) % of Public expenditures on education / GDP	1) OECD Education at a Glance	Annual	4
	2) Numbers of students on primary/secondary and tertiary levels (and annual growth rates)	2) OECD Education at a Glance, Eurydice	Annual	4-5
	3) Scores of students in international and national tests (student performance)	3) PISA, TIMMS results	Not frequent	4-5

[54] Given the richness of indicators in this area, a specific policy tension has been added, i.e. "Globalisation vs. staying within national borders"

Table 14: Core Tensions & Indicators (cont.)

Tensions	Indicators	Source	Frequency	Reliability
Market Dynamics vs. Public Good Values	1) Legal framework in EU countries allowing the operation of Private Universities	1) National Law sources, Ministries of Education		4
	2) Legal framework in EU countries to allow for tuition charges	2) National Law sources, Ministries of Education		4
	3) Number of 'new' private kindergarten	3) National sources	Annual (all)	4
	4) Number of 'new' private primary/secondary schools	4) National sources		4
	5) Number of 'new' private universities	5) National sources		4
	6) Number of 'new' private vocational schools	6) National sources		4
	7) Ratio of above-mentioned numbers of 'new' private/public schools [indicators 2, 3, 4, 5]	7) National sources		4
	8) Contracts granted (by Ministries of Education and other public institutions) to the private sector in areas such as testing	8) National sources		4
Generalization vs. Specialization	1) General v. skill-specific education: a) net entry rate of students in university v. vocational institutions b) expenditure per student (/GDP per capita) on vocational v. university education	1) Eurydice	Annual	4-5
Information vs. Knowledge	1) Students' time-allocation (among different information/learning channels)	1) National sources, Ministries of Education	1) Annual	4-5
	2) Educational performance	2) National exam scores, PISA and TIMMS scores	2) Annual, Infrequent	4-5
Individualization vs. Socialisation of Learning	1) Class size in public/private schools	1) Eurydice, Ministries of Education	Annual (all)	4-5
	2) Number of collaborative (teamwork)-projects in class, per year	2) National sources, Local education authorities		3

Table 14: Core Tensions & Indicators (cont.)

Tensions	Indicators	Source	Frequency	Reliability
Encourage Traditional Providers vs. Bringing New Actors to drive Innovation in E&T	1) Number of 'new' non-school companies in learning/e-Learning	National sources (all)	Annual (all)	4
	2) Number of 'surviving' non-school companies in learning/e-Learning			4
	3) Number of 'new' private kindergarten			4
	4) Number of 'new' private primary/secondary schools			4
	5) Number of 'new' private universities			4
	6) Number of 'new' private vocational schools			4
	7) Ratio of above-mentioned numbers of 'new' private/public schools [indicators 3, 4, 5, 6]			4
More Investment vs. More Efficiency	1) Private/Public (ratio) expenditures in education (primary/secondary, tertiary)	1) Eurostat, OECD, Eurydice	Annual (all)	4-5
	2) Structure of funding/responsibilities (state/region/municipality)	2) National sources, Ministries of Education		4
	3) Number of countries in which purchase/hiring decisions have been delegated to schoolmasters/local-educ-authorities	3) National sources, Ministries of Education		3-4
	4) Average duration of non-permanent university faculty and ratio of non-permanent/permanent university faculty	4) National sources, Ministries of Education		3-4
Focus on Young People vs. Re-directing Resources to Adult Learners	1) Young/Old Public Expenditures (ratio) in education (old = lifelong learning)	1) Eurostat, OECD, Eurydice	Annual	4
Continuity vs. Experimentalism	1) Legal framework for adopting/using e-Learning (VAT in e-books compared to printed books)	1) National sources, Ministries of Education	Annual	3-4
	2) 'Eligibility' for e-Learning materials/training in university/vocational training	2) National sources, Ministries of Education		3-4
	3) ICT adoption in schools (infrastructure, students-usage, teachers-training)	3) Eurostat, OECD, Eurydice		3-4

8. HOW CAN LEONIE BE USEFUL?

8.1 What has the LEONIE process told us?

Through the organisation of national seminars and a final conference, the LEONIE observatory has attempted to promote informal discussion and networking arenas on the future of education and training in Europe and worldwide, thus establishing a basis for a **European wide dialogue** on the future of education and training. In these occasions the debate on European education and training policies has been opened up in a non-ideological way to European E&T stakeholders, outside of the official 'representative tables' in search for news angles and perspectives for the debate.

The main lesson to be drawn from this process is that elaborating a strategic and widely agreed on project for the future of European learning systems is possible, and in order to allow the debate to be structured in the form of core tensions so as to get to a shared agenda between the European education and training stakeholders on the actions reckoned as more appropriate to shape the future of European learning systems.

The reactions of most of the participants of the LEONIE conference, seminars and research, (more than 2,000 people) have been extremely encouraging. Several additional seminars have been demanded and scheduled for the next few months.

Nevertheless, this is to be intended as an on-going process, which could be continued through the establishment of a **forum evolving towards a 'laboratory'** for consensus building on proposals and initiatives aimed at enhancing and giving to European lifelong learning its rightful place.

The following paragraphs illustrate the possible ways of using the LEONIE results and thus achieving a critical mass of consensus on the process so as to make it self-sustainable in the form of the forum described above.

8.2 How to use the LEONIE Results?

Future studies do not deal exclusively with attempts to predict the future. Of course, there is a predictive element in all the future studies. By studying the future, researchers intend to anticipate what lies ahead. But "the future doesn't just happen: people create it through their action - or inaction - today."[55] A shift in perspective is therefore required. By considering what might happen, researchers, practitioners and policy makers can more rationally decide on the sort of future that would be most desirable and then work to achieve it. More importantly, they can actively decide upon how they will live in the future, by making choices today and realizing the consequences of their decisions.

Consequently, once a predictive capacity has been established, the focus should be on how individuals and organisations could develop their pathways and aptitudes for the future.

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[55] See the presentation of the World Future Society at http//www.wfs.org

With regard to that, individuals and institutions face a basic choice, as they could assume four different attitudes to change processes[56].
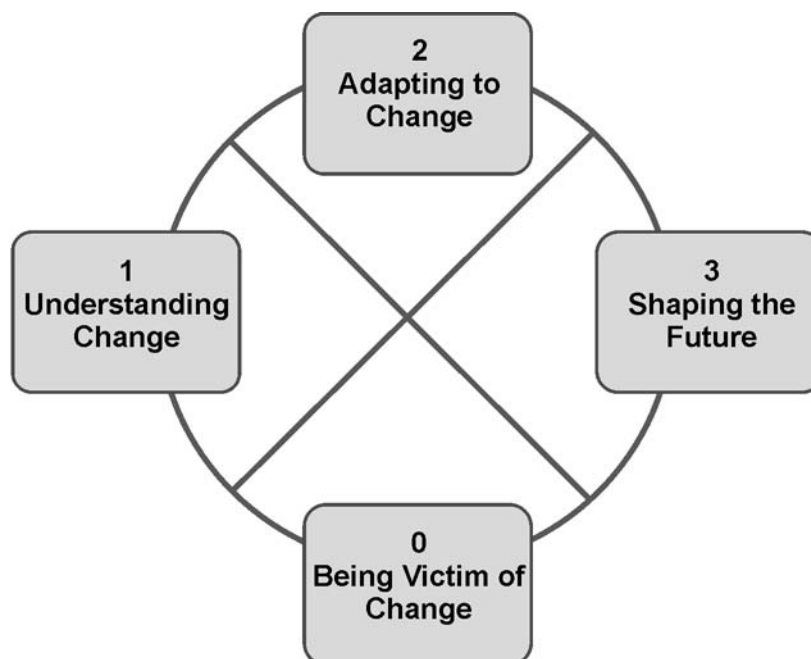

Figure 16: Attitudes towards Change Processes

0)   Inertia: being victim of change

Inertia could be defined, as 'the resistance of education and training systems to change in any of the directions towards which innovation programmes and market forces would tend to push is the characterising element'[57]. Inertia could be the result of 'protectionist' public policies that prevent private and generally new actors from interfering in formal provision of education and training (closed accreditation systems, emphasis on formal titles to access public administration, etc.) or of a failure in the implementation of innovation policies, or of the internal resistance to change among E&T actors.

1)   Awareness: understanding change

In many cases the inertia of E&T systems, as well as individuals and organisations, is motivated by the lack of understanding of change processes taking place within and outside learning systems. A step forward in this respect is the development of an awareness of change processes taking place, which might also lead to a predictive capacity. However, developing visions of change does not lead necessarily to the ability to cope strategically with change, although it is indeed a step forward. The next two paragraphs describe the possible attitudes of social actors once they are aware of change processes taking place.

2)   Re-activity: adapting to change

Also the reactivity attitude embodies a resistance to change. Reactive individuals, organisations or learning systems are overwhelmed and threatened by the challenge of diversity and change, but instead of reacting with inaction, as in 0) and 1), they

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[56] The question of how institutions respond to change and 'paradigm shift' has bben raisedby Thomas S. Kuhn in his book 'The Structure of Scientific Revolutions'. Kuhn suggests there are four responses to a crisis of paradigm:
-   An immediate change to the new paradigm.
-   A 'wait-and-see' attitude.
-   A seeing of 'new discoveries' upon examining anomalies.
-   A refusal to accept change-the new.
     Thus the type of response one takes depends on how much one has invested in the old paradigm
[57] See 'L-Change-European Observatory on IST Related Change in Learning Systems IST-2000-26226' Scenario and Forecast Report

react with a defensive posture towards change, i.e. by using short-term interventions in order to return operations to normal -the way they were before the unexpected change. Their orientation is toward the past, expressed by a 'we-have-always-done-it-this-way' mindset. Such an approach is not open to novelties, but is steeped in tradition and its preservation. The result of such reactive posture is the focus on immediacy and adaptation to change instead of long-term change.

3) Pro-activity: shaping the future

On the opposite side there is pro-activity or experimentalism that could be defined as follows:

A pro-active organisation or learning system operates on the basis of 'Foresight Management', anticipating rather than merely responding to change. Such a focus will turn what may appear to many to be a potentially dangerous challenge, into an opportunity.

Operating according to this perspective means being attentive to 'weak signals' that are marginal to the dominant culture, such as new learning paths, settings, methodologies, and being able to incorporate them while maintaining one's own identity.

In extreme cases, this approach may lead to adopting an entire paradigm shift –and a different mindset- in order to steer future developments in a direction consistent with their own strategy, especially in case this approach becomes systemic[58].LEONIE is explicitly encouraging and supporting policy makers, individuals and organisations to adopt such a proactive attitude.

Following this approach, the LEONIE consortium has identified several **levels of use** of its results and findings, in particular when it comes to the list of trends of change, policies and the tensions identified.

They have been listed below:
● Analyse the current situation;
● Scenario building;
● Planning influence on the future.

8.2.1 Analyse of the current Situation

a) Use the list of trends of change and tensions affecting learning systems to analyse one's own context and position

In the framework of conferences and seminars on the future of learning systems, the list of trends of change and policies can be useful when analysing the change processes undergoing in a specific country or sector of the participants in the discussion, when analysing how these trends and policies occur in their context, and when formulating some interpretations of differences. This is the exercise conducted in the national workshops and has proved to be extremely effective in opening a structured dialogue.

b) To analyse and assess past and present policies according to the set of tensions

Policy makers at European and national levels could assess policy aims/strategies against the tensions they identify. The tensions proposed by the LEONIE consortium could also serve as means for assessing policy aims in view of their impact on the development of future learning systems.

In this respect, it is fundamental to clarify what 'assessing policy aims' means. Each of a given set of educational policy aims described could be inserted in a table and its contribution to shaping the evolution of learning systems in the direction of each of the relevant uncertainties could be assessed.

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[58] The case of Finland as a 'learning nation' is well known in this respect.

In this way policy makers could:

1. Achieve a better understanding of the trade-offs and the balances of forces that every political initiative directed towards E&T systems implies;

2. Develop general policy aims into specific objectives by responding to the following question: how could each term of the relevant tensions be dealt with in the framework of the policy aim proposed?

3. Since every tension is associated with indicators[59], policy makers could be in a position to assess the potential impact of their aims/strategy on fundamental dimensions such as the promotion of access/excellence, young/adult education.

For instance, the detailed work programme for European education and training formulated by the European Council in 2002[60] could be assessed according to the methodology described. Furthermore, the LEONIE findings show that there is room for influencing European policies and contributing to shaping future education, e.g. by opening to stakeholders the debate on 'Education and Training 2010' launched by European Ministers of Education.

c) To articulate the political debate

According to the LEONIE consortium, the set of tensions presented above may be useful for nurturing the debate and the research on the future of learning systems. In fact, the tensions identified by the LEONIE consortium can be observed at macro-level, meso- or micro-level. Different tensions can assume a different importance at macro- (E&T system), meso- (organisation level), and micro-level (individual level). Variability of developments is also contingent upon different sectors or dimensions of education and training and other, context-related tensions can be included in the model.

As an example of possible use, the debate on policies for education and training can be structured around the tensions model. Policy makers could position their action/strategy initiatives in a spider web diagram below, which represents a cluster of tensions. The poles of the tensions visualize the desired future, e.g. in terms of innovation. The spider web diagram also serves as a tool for gaining understanding about whether they are spurring the direction of learning systems mainly toward innovation or tradition or a balance between them. The following graphs represent visually this process, although the poles embodying innovation or desired future might change according to the context.

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[59] A specific chapter on indicators will be included in the final report
[60] See Detailed work programme of the Council on the follow-up of the objectives of education and training systems in Europe [Official Journal C 142 of 14.06.2002].
    http://europa.eu.int/comm/education/policies/2010/doc/10_year_en.pdf
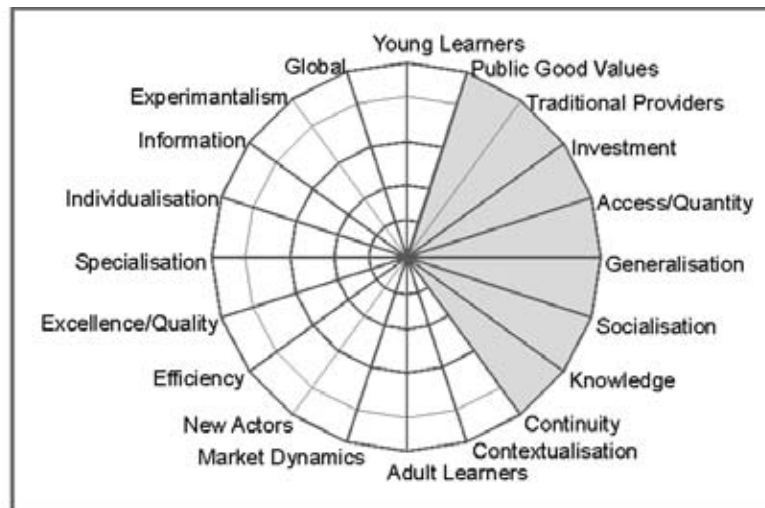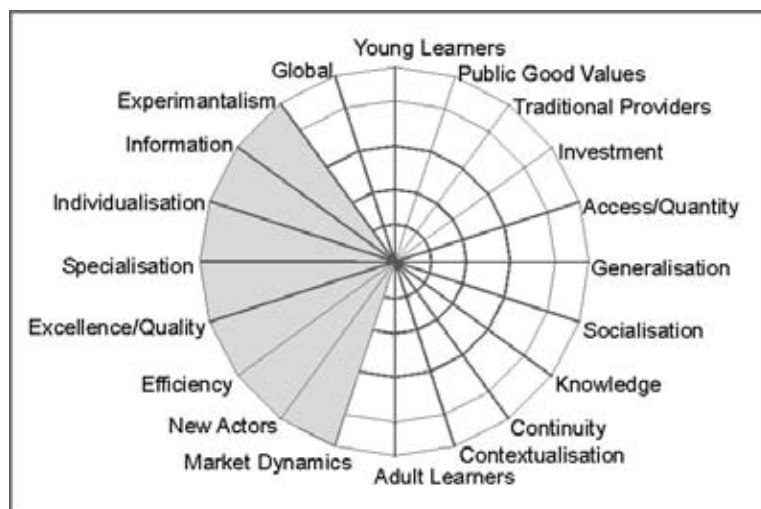
Figure 17: Traditional Pattern of E&T Systems

Figure 18: Mainstream Reform Pattern or E&T Systems
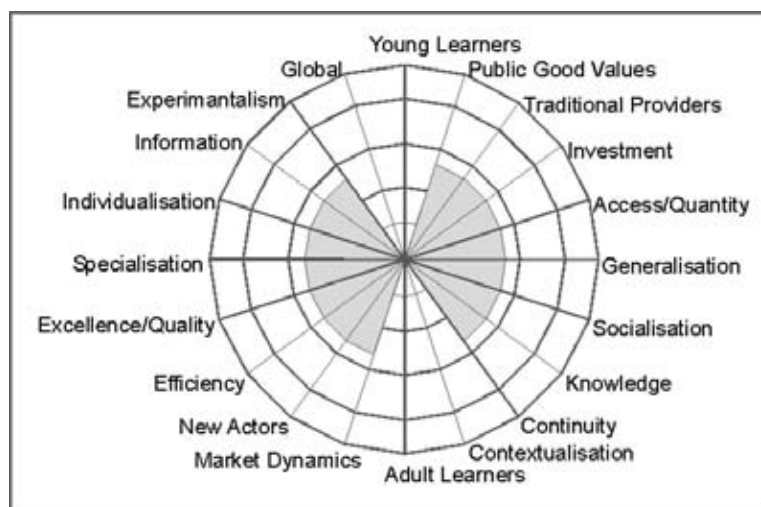

Figure 19: Balanced Pattern of E&T Systems

8.2.2 Building Scenarios

Another example of the application of the tension force models is scenario building. A systematic and step-by step toolkit for scenario building is provided below.

Table 15: Preliminary Stage: Identifying the Scenarios

1.	First individuals and organisations should define their forecast activity in terms of spatial scope, temporal scope, and extent of the research effort…
2.	Through surveys, brainstorming or interviews with the relevant stakeholders, they decide which trends and which actors could shape the evolution of their sector/organisations over the time span and the spatial scope agreed.
3.	Once a list of trends of change is produced, a mapping exercise follows. A shortlist of the most influential trends should be produced. Most influential are those trends that are likely to have a greater impact and a higher level of autonomy (they do not depend to a great extent on contextual forces to take place) compared to other trends of change.
4.	Bundles of most influential trends that have some commonality have to be clustered on the basis of their affinity. This clustering exercise should help in pointing out whether there are conflicting / diverging sets of coherent trends.
5.	Conflicting /diverging sets of coherent trends should be labelled by a synthetic definition in the form of a binary couple of concepts, reflecting critical uncertainties. This exercise should lead to the conception of a limited number of dichotomies.
6.	Two fundamental uncertainties should be spotted. They could be presented visually in a matrix composed by two orthogonal axes, positioning every term of the dichotomies at the extreme of every axis. The two axes crossing define four different quadrants of uncertainty. Each of these far corners is, in essence, a space for elaborating scenarios that can be explored. The same procedure can be done with three fundamental axes. Nevertheless, it is at this stage preferable to stick to two axis of evolution.
7.	On this basis it is possible to elaborate the first prototype scenarios, corresponding to each of the regions identified. Each of the regions indicates a direction of evolution: the scenario designer, referring to the actors and trends of change spotted at the beginning of the exercise, try to imagine how actors and factors could position themselves and interact in the main direction of evolution corresponding to peculiar intertwining of the axes of evolution identified. The result would be a narration of a plausible future, or a prototype scenario.

Being aware of the fact that this procedure might seem quite abstract, the Leonie consortium has elaborated some examples of its application, relying on the polarities and the trends/signals or policies identified in the framework of its research activity.

Two examples are presented below. The first refers to the whole of E&T systems, since the LEONIE research activities have focused mainly on macro-level. The second refers specifically to the evolution of the learning practice, a dimension considered very important by the participants in the research stage.

As for the first scenario matrix, the dichotomies access vs. excellence and convergence vs. context have been chosen, thus allowing conceiving four scenarios. These have been called:

1. 'Mc-learn': the learning supermarket;
2. 'Civitas': learning citizenship;
3. 'Ask the Wizard': Professional learning communities;
4. 'Knowledge valley': Global networked centres of excellences.

The second scenario matrix has been composed on the basis of the dichotomies 'Individualisation vs. Specialisation' and 'Status quo vs. New actors' in education and training

1. 'School desk': back to the future:

2. 'Agora': technology-based and social learning;

3. 'The monad': individualised learners or 'groups of alikes';

4. 'The pyramid': learning have and have not.

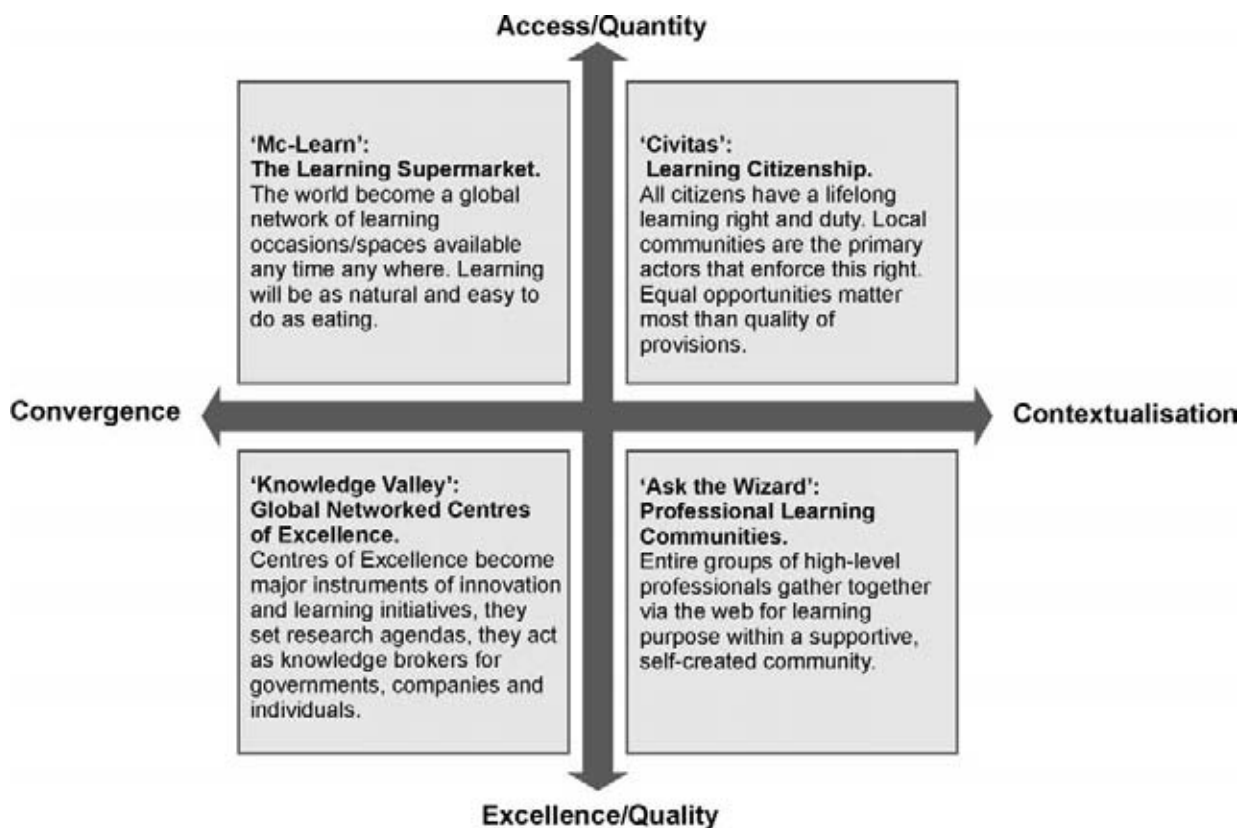The resulting prototype scenarios are represented visually below.

Figure 20: Scenario Matrix for Access vs. Excellence & Convergence vs. Context

Figure 21: Scenario Matrix for Individualisation vs. Specialisation & Traditional Providers vs. New Actors

Refining and expanding the scenarios

The organisation of the main axes of uncertainties in the form of a matrix gives the scenario designer an effective framework to design prototype or proto scenarios. At this stage the scenarios are refined and further elaborated.

In order to enrich the description of every scenario and understand whether it has a heuristic potential, one can insert a prototype scenario in a table including all the polarities identified and reason about the possible correspondence of every scenario with different polarities. The more a scenario corresponds to different polarities, the higher will be its comprehensiveness and explanatory potential of future developments into learning systems.

The following table illustrates the correspondence between the first set of scenarios and all the polarities identified by the LEONIE consortium.

Table 16: Correspondence of Scenarios and Polarities

Scenarios/Policy Aims / Core Polarities		'MC-Learn': The Learning Supermarket	'Civitas': Learning Citizenship	'Ask the Wizard': Professional Learning Communities	'Knowledge Valley': Global Networked Centres of Excellence
A	Convergence	X			X
B	Context		X	X	
A	Access	X	X		
B	Excellence			X	X
A	Market dynamics	X			X
B	Public good values		X		
A	E&T status quo				
B	Bring New actors	X		X	X
A	Generalisation				
B	Specialisation			X	X
A	Information	X			
B	Knowledge		X	X	
A	Individualisation	X			
B	Socialisation of learning		X	X	
A	More Investment				
B	More efficiency				
A	Focus on Young people		X		
B	Re-direct resources to adult learners		X	X	
A	Continuity		X		
B	Experimentalism	X		X	X

For instance, the 'MC-learn: the learning supermarket' scenario has been previously described as a scenario in which the world becomes a global network of learning occasions/spaces available any time, anywhere and learning will be as natural and easy to do as eating. This proto-scenario has been built in the region of the matrix, featured by globalisation and access. But one could easily argue that the full deployment of this scenario will imply the massive entry of market paradigms into education and training, and in particular the emergence and consolidation of new actors, especially private. Global players becoming hegemonic could increase the convergence of learning systems, but at the same time the invasion of learning products in the market and the diversifications of learners' lifestyles as 'consumers of learning' could increase the fragmentation of learning systems and ultimately their divergence. The abundance of learning opportunities implies also that learners will have to deal with an overload of stimuli, and be able to manage impressive flows of information and data. All these elements can enrich the description of a scenario.

The case corresponding to dichotomies, which have hnot been filled in reflect a condition in which it is not easy to foresee towards which direction of the dichotomy the scenario designed is leading.

In conclusion, two limitations as far as scenarios design is concerned must be made explicit:

● The resulting scenarios are obviously 'extreme' situations that would apply only when no countertrends to the generating ones would exist;

● Since the two poles of a tension are not necessarily opposite, the 'real scenarios' would rather need to be built upon original combinations of the poles of the tensions rather then combining two poles of different tensions.

8.2.3 Planning Influence on the Future

It is a strong belief of the partners that education and training should play a pivotal role in shaping the future of Europe, and the LEONIE results could offer a logical and methodological framework useful for those stakeholders who wish to take a proactive approach. The scheme presented in the following page represents a possible path in this direction.

The left part summarises the LEONIE proceedings for identifying a foreseen evolution in terms of trends of change expected to take place, and expected policies and visions and values likely to emerge. These proceedings have been described in the previous chapter of this report, so it will not be dealt with in detail here. Thanks to future studies and consultation with relevant stakeholders, individuals and organisations make an effort to step back and take a look at where society and education are headed, in order to come up with a foreseen evolution in a given context (country, sector, institutional setting, culture, etc.).

Then, as mentioned above, individuals, organisations or E&T systems have to make a basic choice:

● Ignore the foreseen evolution or try to understand it without changing your own behaviour (two inertial attitudes);

● Adapt to change (reactivity);

● Implement a transformative strategy (proactivity).

This would imply that, in view of an expected change, the 'pro-actor' looks at itself and its organization and asks, "What values are leading our views?" (Value statement), "What are our objectives" (Mission statement), "Where do we fit in this context?" (Vision or Strategy statement).

The next stage is examining the total "learning patrimony"[61] in which the pro-actor operates: the structure, curriculum and a set of values, dispositions and attitudes with regard to education and training. In this context the pro-actor should assess which are the proximal and distal forces that he can use as levers of manoeuvre in order to achieve its change strategy and make it systemic.

The political context in which initiatives can take place have to be considered, of course: then the level of influence that each stakeholder can exert on policies, research agenda or simply on current practice has to be honestly estimated and explored. Multiplying pro-active attitudes and behaviours may bring education and learning systems back to the role that they are expected to have in the new knowledge society. This means creating a structural and cultural paradigm shift, consistent with the needs of a changing society, in which all innovation forces and champions heading in the same direction are federated and a fertile climate for innovation is created institutionally, with effects on policy, research, and practice.

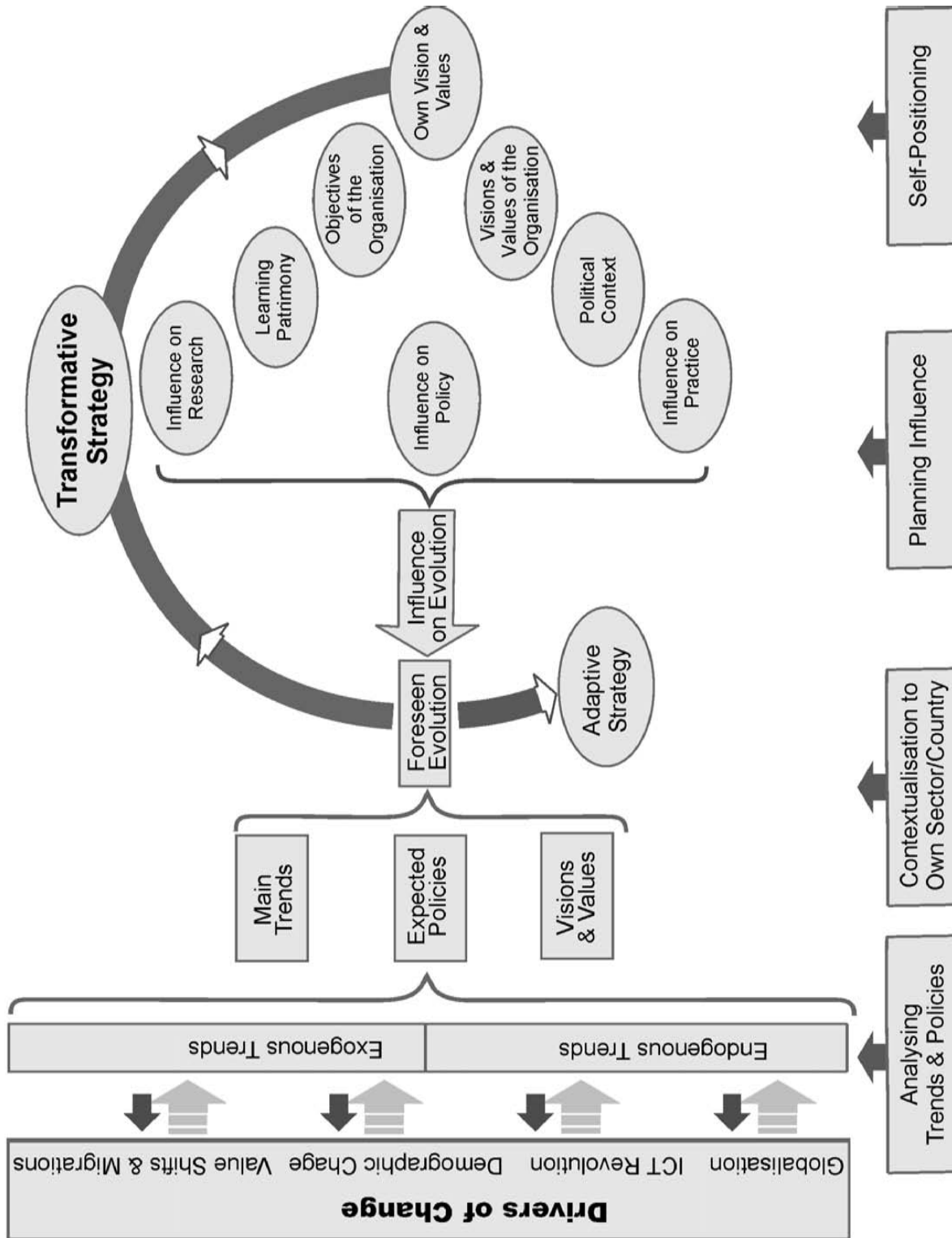[61] See the POLE project final report; http://www.education-observatories.org/pole

Figure 22: Methodological Framework & Transformative Strategy

8.3 The Way Forward

8.3.1 The Future of LEONIE

The reactions of most of the participants of the LEONIE final conference, national seminars and research activities, (more than 2,000 people) have been highly encouraging. The Leonie results stimulated lively and also controversial discussions, which were described as extremely interesting and useful in order to land in a more concrete reality. The national perspectives brought in new dimensions to the results of the Leonie research. A large number of active and committed participants and speakers drew a variegated picture of the complex situation in education and training across Europe in consideration of the questions raised by Leonie.

There was an explicit consent to the critical endeavour of the Leonie project, which stimulated an urgently needed discussion process about crucial issues in education and training not just on a regional and national level but lifted it on a European level. After all, the participants of the national seminars and the final conference had the occasion to meet and exchange ideas and views regarding the trends and policies determining national and European educational systems. Moreover, there was an agreement that the developments in other European countries could provide helpful suggestions for national reforms.

This is why the LEONIE partnership, even beyond the end of the project in April 2005, intends to keep consulting policy makers, researchers, experts, but also practitioners and other stakeholders on the future of European learning systems and publicize the results of this ongoing exercise.

Furthermore, LEONIE foresees the collaboration with existing observatories (UNESCO, OECD, eLIG, EUROSTAT, CEDEFOP, EUN, HELIOS etc) and other institutions as another field of possible productive activity where LEONIE methodology and results can contribute to a better understanding and evaluation of ongoing and future analysis of learning systems. The ongoing research activities and the synergies with existing observatories will also lead to the organisation of joint seminars and conferences on the Future of Education and Training in Europe and worldwide.

Through the organisation of such events, the LEONIE consortium intends to promote informal discussion and networking arenas on the future of education and training in Europe and worldwide, thus establishing a basis for a **European wide dialogue** on the future of education and training out of the official 'representative tables'.

This is to be intended as an on-going process, which could be continued through the establishment, consolidation and animation of a **forum evolving towards a 'laboratory', or a community of practice** motivated to enhance and give to European lifelong learning its rightful place in the knowledge society and build consensus on proposals and initiatives aimed at achieving this goal.

Finally, an **action plan** on the future of LEONIE should include the following issues:

● Carrying on research and dialogue in order to deepen and widen observation activities on change into European learning systems;

● Multiplying the discussion arenas on education and training;

● Building on the LEONIE results so as to stimulate proactive and transformative approaches to change;

● Using the LEONIE results and thus achieving a critical mass of consensus so as to make it self-sustainable.

8.3.2 Implications for Policy and Practice

The future of learning systems in times of fast and hectic changes is a delicate issue. Today, there are a lot of massive education reform projects going on across Europe due to European initiatives like the Lisbon process, the Bologna objectives or the PISA report in order to consolidate the European dimension of education. That is to say, European E&T systems are under reconstruction at the moment. Moreover, recent social and economic changes have generated new debates that have obliged politicians to opt for some stands and therefore some ideological debates have risen to face these new challenges. One of the most important grounds for these disputes has been education and as a consequence, educational reforms have become increasingly short lived and have fallen in ideological dispute in detriment of deeper and more specific debates. So the national educational policies are deeply influenced by short-term goals resulting in a series of quick changes and reactive reforms.

Therefore, the most important and general policy implication of the LEONIE research as regard the European, the national dimension and the sectoral level bears on the implementation of a transformative strategy (see the previous chapter) oriented towards **fostering innovation in education and training.**

This can be achieved by:

● Federating innovation forces into education and training and promoting **innovative networking and partnership arrangements**, allowing public institutions to envisage and allow inter-departmental re-design and collaboration, support the setting up and running of innovative partnerships, facilitating their medium and long-term sustainability. Likewise, the policy should allow room for envisaging and developing ways of collaboration between teachers, domain experts, animators and other rapidly emerging teaching functions, both within and between institutions;

● Revising policy making at the level of **national curricula and programmes**, so as to enable the development of those areas of the curricula most amenable to innovation in teaching and learning;

● Granting more **autonomy to E&T institutions** so that these be able to modify their internal structures along the lines of learners, society and markets' needs;

● Furthermore, more attention should be dedicated to the **systemic resistance to innovation** within education and training. "We usually look at early adopters of innovations, but we need to know more about the attitudes of people who resist the innovation processes"[62]. Policy actions should rely on successful experiences of innovation transfer and investigate their scalability at different organisational levels.

More specific recommendations for policy actions are listed below.

● **Promote research and dialogue on education and training at the international level** Longitudinal projects dealing with long-duration innovations in one or more institutions would provide insights with respect to sustainability and expansion of innovations into education and training. Also comparative transnational research should be fostered, attempting to analyse and compare E&T systems in a more 'holistic way' than looking only at students' outcomes (as it is the case for the OECD-Pisa approach);

● **Cope adequately with policy tensions.** The LEONIE research activity has attempted to demonstrate how the educational and training sphere is currently subject to a series of tensions, although not necessarily opposite. Coping adequately with tensions can give rise to genuine innovation. Policy makers need to find the right blend of policies which foster one, the other or both extremes of the tensions so as to transform potential constraints into opportunities;

● **Re-define and re-align learning systems vis-à-vis the State, the civil society, the voluntary sector and the market**. Leonie has detected the ancillary role of the education and training spheres in relation to the economic sphere. But education

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[62] See also on this issue, the outcomes of the MERLIN Monitoring and Evaluation of Research in Learning Innovations project; ftp://ftp.cordis.lu/pub/improving/docs/ser_clusters_education_merlin.pdf

is a problem of the whole society, and cannot be considered a passive transmitter of market paradigms. Consequently, there is a need for making European learning systems the leading area of change and proactivity in the knowledge society. Investing more in developing change management processes and learning organisation approaches into education and training can do this. Furthermore, institutional and professional autonomy coupled with social accountability (i.e. socio-political and economic accountability) seem to be amongst the most crucial points;

- **Avoid self-referentiality of educational, training and informal learning systems.** This does not only mean that partnerships and inter-organisational cooperation should be established (as mentioned above) but also that exchanges of best practices should encompass cross-sectoral, cross-cultural and international learning experiences, management, quality and cost effectiveness assurance models, research results and capitalisation of experiences;

- **Consolidate the European dimension of education.** A European framework of reference for transparency of qualifications is needed in this respect. Virtual and physical mobility is to be increased by active sponsorship and removing obstacles;

- **Improve and diversify investment in social capital.** In the current economic and budgetary climate, the case for a 'substantial increase' in investment in human resources sought by the Lisbon European Council remains stronger than ever, particularly as it conditions future growth as well as social cohesion. The required funds should be raised efficiently with a well-balanced mix from public as well as private sources. Also, the education system has to become more efficient and of better quality. For this purpose, it is important to open up the institutions (self-government);

- **Let lifelong learning become reality for all citizens.** To achieve the goal of lifelong learning, comprehensive, coherent and well-coordinated strategies are needed. Appropriate measures have to aim at disadvantaged groups. Common European centres of reference and principles have to be applied. The personal development and fulfilment of individuals, their social and professional integration and any subsequent learning is largely dependent on the acquisition of key competences by the end of obligatory schooling (foreign languages, mathematical literacy and basic competences in science and technology, ICT skills, learning-to-learn skills, interpersonal and civic competences, entrepreneurship and cultural awareness).

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RELEVANT WEBSITES

- Cable in the Classroom http://www.ciconline.org/default.htm
- The centre for future studies http://www.futurestudies.co.uk/
- European awareness scenarios workshops http://www.cordis.lu/easw/home.html
- European Commission, Scenarios Europe 2010 http://europa.eu.int/comm/cdp/scenario/index_en.htm
- European Commission, The Institute for Prospective Technological Studies http://www.jrc.es/home
- Future learning project http://www.ub.es/euelearning/
- LEONIE website: http://www.education-observatories.net/leonie
- Metafuture organisation http://www.metafuture.org/
- POLE project -'Policy observatory on Lifelong learning in Europe' final report www.education-observatories.org/pole
- The Prague Communiqué on the future of Higher education http://www.eurashe.be/info/Prague_communique.PDF
- The Project on the Future of Higher Education-USA http://www.pfhe.org/
- Resources on Future studies http://www.aleph.se/Trans/Cultural/Future/
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Understanding Change, Adapting to Change, Shaping the Future

Change Drivers, Trends & Core Tensions for European Learning Systems & Educational Policies

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