eLearning

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**CONTENTS**


**SUMMARY** 4

**SECTION 1**
**Methodology of the Project** 6

**SECTION 2**
**Key findings of the projects. Indicators of change**

1. Pedagogical factors affecting learning in ICT learning environments 14
2. Institutional/organizational changes as a result of ICT and e-learning implementation 20
3. Socio-Economic aspects of innovations 27

**SECTION 3**
**Key findings of the DELPHI workshop and recommendations**

1. Workshop Summary: Sustainability; scalability and transferability of innovations 34
2. Conclusions and recommendations 37
3. Areas for future Research 39

**ANNEX 1** 41

Transcripts of the Workshop presentations and discussion

# SUMMARY

The DELPHI Project, funded under the e-Learning Action Plan, has reviewed the results of thirty projects variously funded under the Socrates Minerva, the IST and Improving Human Potential Programmes. The project has aimed to shed light onto whether fundamental changes have arisen at the level of the methodologies and the learning processes necessary to propose a future agenda for enhancing the innovative use of ICT across a wide range of educational sectors. It has done this by trying to answer a series of transversal research questions which encompassed the following questions:

1) What are the new methodological approaches to learning in technology-based learning scenarios and what is their efficiency? What are the new co-operative learning processes, the cross-curricular skills and changes in teaching/learning, role changes configuring technology ICT-based learning innovations? How is effectiveness considered in the different innovations analyzed?

*2)* What are the consequences for organizations when introducing these new ways of learning, including European cross-cultural issues involved in the process?

3) What are the contributions of ICT to lifelong learning in terms of access to education and training? Does the introduction of ICT stimulate the dual society and thus social exclusion?

At the same time the project has sought to utilize knowledge generated by a range of sub-activities in the context of developing an Internet-based Observatory on Learning Innovation. These activities have ranged from thematic study reviews to expert group discussions, envisioned the establishment of a monitoring system and the maintenance of the Observatory.

The project review process was undertaken in WP2 and WP3, whereas WP3 synthesized the main results and prepared the documentation for the organization of the Expert's Workshop in the WP5.

The reviewed projects were contextualized within an area perspective and, in the case of Socrates Minerva projects, an additional sectoral perspective (schools, adult education and higher education). The areas demarcated were pedagogical, institutional and cross-cultural / socio-economic. Within these areas particular focus was located in respect of the identification of methodological trends, issues related to learning scenarios, gender perspectives to ICT Assisted Learning and socio- economic variables affecting/affected by ICT Assisted Learning.

This report is an output of Work Package Five, **Establishment of a framework for a European-wide discussion: the European Laboratory for innovation in e-Learning**.

The tasks that were undertaken within the deliverable were:

**a)** To organisation and realisation of a Workshop for discussion of transversal questions posed, and for dissemination of the results. The Objective was to examine and discuss the findings out of the transversal questions posed in Deliverables 4, to discuss recommendations for future research and policy recommendations, and to disseminate its results, with the participation of several experts from the projects considered as well as with the Commission policy makers.

**b)** To synthesise of Workshop results. The objective was to compile and synthesize the results of the workshop, including feedback contributions to the initial draft report from participants. The Workshop site can be visited at http://www.ub.es/euelearning/delphi/worksh.htm

**c)** To create a Laboratory of ideas about e-Learning. The objective was provide the technical and organisational structures needed for creating an space as a source of reference and guidance to European research, being ac active promoter and disseminator of innovative research projects. The Laboratory site can be visited at http://www.ub.es/euelearning/delphi/laboratory.htm

This report is concerned with an overview of the findings and the emergence of indicators which might be relevant for policy making and practitioners and formulating suggested pathways for future research. The report synthesise the findings, which were also part of the barckground information of the Workshop.

The second part of the Report gathers the key finding of the DELPHI Workshop, which was held in Manchester. The reflections and discussion of the Workshop feed at the same time the DELPHI Laboratory. It includes mainly the results of the discussion on scalability, transferability and sustainability of e-Learning innovations, a transversal area which was key on the discussions.

Finally the report gathers the conclusions of the Workshop on e-Learning policy issues and policy recommendations.

# 1 Methodology

In this section we look at the methodology of the project as a whole. We start with a general overlook to the methodology used in the review of the 30 Minerva, IST and Socio-economic Research projects and its connection to the creation of the Laboratory of e-Learning

## 1.1 General Approach

DELPHI conceptualized itself as a project of a meta-evaluation and reflection about innovation in emergent e-learning practice. The aim has been, through a critical review of the outputs of research projects of similar thematic orientation, to indicate how an agenda of dialogue between the "projects" (in terms of their outputs) and policy makers could be derived. The review of different sets of projects was undertaken in order to identify similarities/differences and trends of an organizational, socio-economic and pedagogical nature which would facilitate the **formulation of indicators** for the assessment and evaluation of innovation in on-going projects. A critical analysis aimed to define the specific pedagogical and socio-economic parameters for the discussion between the investigated projects and policy making.

The project has defined in its Technical Annex, a set of transversal research questions as a starting point:

1• what are the new methods and technologies (supporting these methods) and what is their efficiency? What are the changes in teacher-pupil roles, and in the whole learning environment?

2• what are the new learning processes, the new cross-curricular and communication skills, the market-oriented issues, and , specifically, the new collaborative learning methodologies involved?

3• what are the components of cost-effectiveness and cost-benefit analysis in these respective projects, and what are the results included in the final reports (taking into consideration how cost/effectiveness and cost/benefit is defined in the projects)?

4• what are the contributions of ICT to lifelong learning in terms of access to education and training? Does the introduction of ICT stimulate the dual society and thus social exclusion?

For purposes of clarity the DELPHI project viewed e-learning to be *a process of inter-active learning in which the learning content is available online and where automatic feedback is provided to enhance the student's learning activity*.

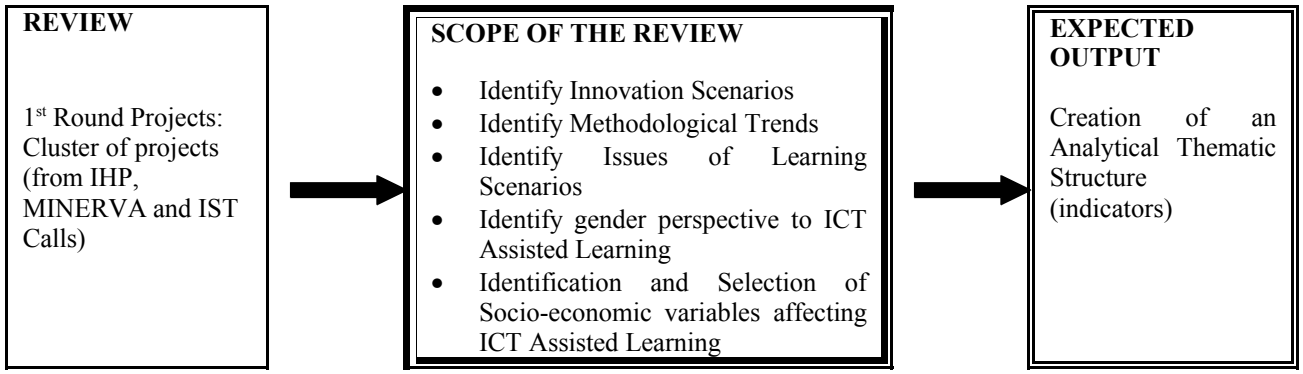
## 1.2 Context – Input – Process – Product Evaluation Model

The project's first stage activity was operationalised at several levels via a 2-phase approach where the first phase constituted a reflective meta-evaluation process of projects

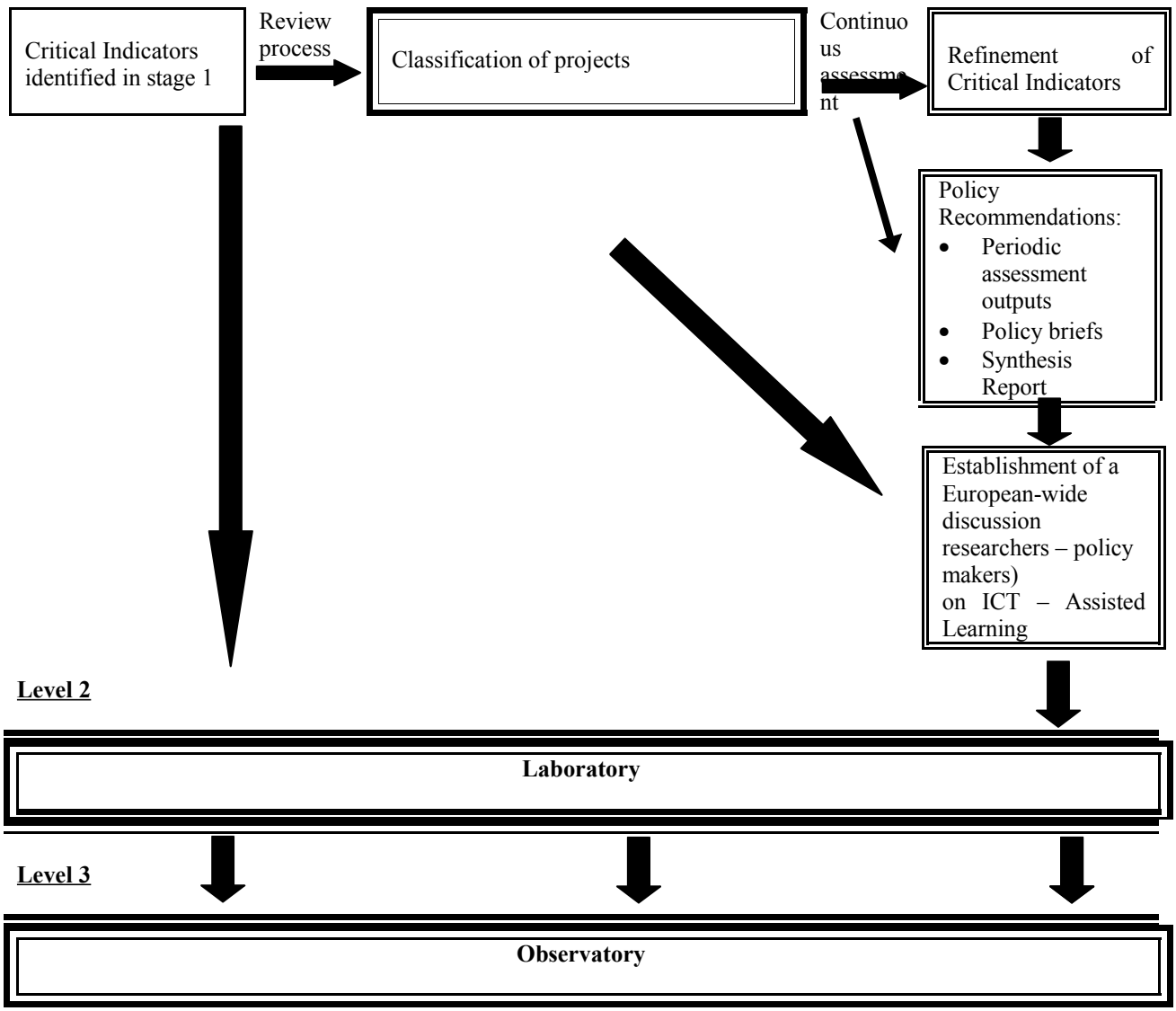
undertaken under IST, IHP and MINERVA programmes and the second phase consisted of a summative assessment of the outputs of on-going projects or completed projects. The methodology adopted involved application of a *Context – Input – Process – Product Evaluation Model* which allowed a reference frame for the organization of the review work undertaken. The model had been selected amongst other reasons for its perceived strength in allowing identification of the policy implications at various levels of project activity and contexts. DELPHI's strategic approach towards the identification of critical indicators of change for evaluation and assessment is shown below:

**Level 1**

***STAGE 1***




*STAGE 2*



## 1.3 Project selection

The review parameters governing project selection were defined within the original DELPHI proposal and were further enhanced during the process of consortium discussion and partial elaboration of that discussion in the state of the art literature review. They included:

1o selection of education sectors
2o selection of projects
3o specification of review parameters
4o design of instrumentation
5o negotiations with projects
6o review of project documentation
7o drafting of case project reports
8o drafting of sectoral reports
9o review of commonalities / differences amongst the sectors
10o reflective analysis of sectoral reports content for the identification of
11o indicators mainly in the areas of learning methods where ICT is involved,
12o new skills and roles for teachers / trainers and new organizational issues
13o reflections on policy needs and drafting of recommendations.

The following areas of key-innovations in e-learning were elaborated to define the scope of the reviews.

| **Pedagogical issues** | **Organizational & institutional issues** | **Socio-economic issues** |
|---|---|---|
| Teaching & learning philosophies | Large scale operations | e-learning standards |
| Teaching techniques, methods & devices | Cost effectiveness | LMS systems |
| Teacher workloads | Flexibility | Globalization & competitiveness |
| Assessment | Incentives | Systems integration |
| Teacher training | Accessibility | Funding & commercialization |
| Teacher collaboration | | M-learning |
| Bandwidth & rich media | | |

The columns indicate the three main research areas and the issues in each of them which formed the basis for the development of a template for the input of data and findings from the reviewed projects. Additionally, a sectoral division was elucidated based in the notion that education sectors traditionally tackle e-learning relying on attachment to paradigms and metaphors. This was expressed as follows:

| | |
|---|---|
| Distance Education | Information Society |
| Training (Corporate Sector) | Knowledge as a commodity |
| Schools (Secondary) | School of Tomorrow |
| Higher Education | Virtual Campus |
| Special Education | Integration |
| Adult Education | Lifelong learning/the market society |

These sectors were aggregated into three sectoral areas supported by specific educational paradigms. The sectoral classification of MINERVA projects was located in these areas:

11. Adult/distance education  LLL, the learning citizen
22. School-based education  School of tomorrow
33. Higher education  Virtual Campus

Teacher training was considered a cross-sector of clear interest, since it is present in all academic levels as a key factor for the success or failure of the learning innovations.

The review process encompassed:

1o selection of projects
2o specification of review parameters.
3o design of instrumentation to record the data in a similar and organized manner.
4o negotiation with projects
5o use of primary and secondary sources of information
6o drafting of case project reports
7o drafting of sectoral reports
8o review of commonalities / differences
9o reflective analysis of review content for the identification of indicators mainly in the areas of learning methods where ICT is involved, new skills and roles for teachers / trainers and new organizational issues.
10o reflection on policy needs and drafting of recommendations.

An initial template designed as a tool for the review of the MINERVA projects (details can be found in WP2) was later amended as the experience of that review exercise suggested that change was needed in order to elicit clearer understandings from the reviewed projects. The revised instrument (see below in section 2.5) was seen as more open-ended in nature and included parameters that were not taken into account in the initial design.

### 1.4 The projects selected

Thirty projects funded under the EU Socrates Minerva programme, IST and Improving Human Potential programmes which fell under the scope of identifying trends for/of e-learning were eventually selected for review. Eighteen of the selected projects were funded under the Socrates Minerva programme, eight were funded under the IST programme and four cluster projects were selected from the IHP programme. The Minerva projects were seen as pedagogically - oriented, which offered possibilities of facilitating identification of pedagogically driven indicators for change, whereas the IST and IHP projects were perceived as offering possibilities of identifying organizational and socio-economic variables as indicators of change.

Projects reviewed under the MINERVA programme were located under the sectors described above and included:

**Adult/distance education:**

1- Adult Education Network

2- European Online Seminar on Urban Transformations
3- Inter North Sea University
4- vital ageing lifelong learning course
5- Virtual Institute for Modelling of Industrial Manufacturing Systems
6- Open Distance Learning in Teacher Training for Inclusive Education

**School-based education:**

- collaborative electronic based networks of teachers
- An innovative approach to the usage of the Internet in a interdisciplinary framework
- Observation and Analysis of the Uses of Information and Communication Technology in European Primary and Secondary Schools: An Intercultural Approach
- e-learning information in geography
- Open and Distance Learning for Secondary Art Schools
- Open and distance learning tools and activities

**Higher education:**

- Benchmarking of Virtual Campuses
- Group for Advanced Learning Environments using Communication and Information Aids
- Collaborative Learning in an International Environment
- Surveys of European Universities Skills for ICT for Staff and Students
- HE5: Improving Open and Distance Learning in a Network
- Studies in Educational Technologies and Training for Teachers

1A further twelve case-studies were selected for review from recently or nearly completed projects funded under the IST and IHP programmes. In consultation with IST programme officials the following projects were selected for review:

1- Area: Preparing for Future Research
2- The Learning Citizen
3- Consensus Building for Education and Training
4- Advance Training Systems
5- Flexible University
6- Pioneering Research for the Future of Learning
7- Open Platforms and Tools for Personalized Learning
8- European Youth in the Digital Age

This set was comprised of one project from each of the IST main Application Areas, in an attempt at ensuring representation of all key aspects reflected in the Programme design.

1The selection of Improving Human Potential (IHP) projects was enabled by a consortium review of the "Briefing Papers"[2] prepared for all IHP projects. Four cluster projects were selected representing IHP principle cluster areas. The corresponding cluster projects for review were identified as:

- Education, equity and social exclusion,
- Education and Labour Market Change,
- Towards the Learning Economy and
- Synergy between Practitioners' needs & opportunities: research orientations & decision making on the usage of ICT in primary and secondary education

Projects once selected were distributed for review among the consortium partners on the basis of expertise and interest.

### 1.5 Tools and instruments used in project reviews

Data and findings collected on the projects was noted under the parameters itemized in the templates. Specific details can be found in deliverables 2 and 3 and the headings in final revised review template can be seen below

Primary and secondary sources of information used in the reviews, where available, were final reports of projects, the most relevant deliverables, any project web site content if available and in some cases academic articles and books presented by the projects' partnerships Following the review of publicly available documentation on the project cases Delphi researchers attempted contact with the projects' contractors This resulted in the gathering of additional information on the projects and their activities and or clarification on project objectives, findings and conclusions. It should be noted here that response levels were variable. In some it was high but in others little interest was shown in collaborating.

### Template headings

1. Name of Project

Programme and Call
Research Task within the Programme
Current Status
Main and specific goals
Envisaged outcomes
Socio-economic aspects
Target population (academic level, sector, etc.)
Statement of the problem
Research questions posed
Objectives of the project
Learning technologies applied
Learning scenario

**2. New methodological approaches to ICT-based learning innovations**
2.1 Definitions and approaches to e-Learning
2.2 Main Learning issue(s) intended to study
2.3 Teaching techniques, methods, and devices
2.4 Teaching and student roles
2.5 Teachers and students interactions
2.6 Attitudes of teachers and students towards ICT
2.7 Assessment
2.8 Teacher workload
2.9 Teacher collaboration

**3. Institutional/organizational changes as a result of ICT and e-Learning implementation**
3.1 Main institutional changes resulted from the introduction of ICT and AODL6into existing structures
3.2 The role of staff training
3.3 Main actors, adopters and resisters to the adoption of the innovation as identified in the project
3.4. Organizational conditions that are (un)supportive to innovation
3.5 Cost effectiveness
3.6 Flexibility
3.7 Accessibility

**4. Other socio-Economic aspects of the innovations**
4.1 E-learning standards: consequences decisions problems reflections
4.2 Globalization: consequences decisions problems reflections and actions
4.3 Other socio-cultural and national factors that influence learning processes
4.4 Funding and commercialization
4.5 Implications for LLL

**5. Innovation addressed/intended; its sustainability and diffusion**

5.1. What was considered innovative?
5.2. Role of the ICT in the innovations
5.3. Were the innovations studied sustainable/scalable

## 1.6 Constraints on effective data collection

In terms of the effectiveness of the template for extracting coherent data, it is important to note that some of the projects under review had not yet reached their final outputs and others had been completed, but the timeline was too short for effective evaluation of their impact.

Further, the projects under review were funded under EU Programmes which intrinsically adopted different methodologies and expected outcomes. IHP, for example, flows from the legacy ring fencing of European social sciences research whereas IST, notwithstanding its inclusion of horizontal socio-economic dimensions, was not per se about research but application[3]. A key objective of the IST programme has been to ensure European leadership in the generic and applied technologies at the heart of the knowledge economy. Within the IHP clusters review programme, analyses were attempted of research activities which were then found to have little or no direct relevance to the explicit issues addressed by DELPHI. This was particularly evident in IHP1 which, with the exception of one project within the cluster, had no direct relevance to the defined objectives of the DELPHI project.

The DELPHI methodology implies an underpinning of an approach which attempts to put aside commonly held formulaic notions of success in ICT projects (e.g., the ideal ratio of computers to students or the ideal application of ICT in educational environments).There is the recognition that the relationship between outcomes is not predictive and linear but is the result of a complex process of interactivity among essential variables and how they develop over time. It became clear during the progress of the project that the lack of detailed sub indicators under the general template headings presented difficulties which encouraged generalized statements (often of intent) rather than evidence-based data on real effects and outcomes. The socio-economic review required, for example, was constrained, to some degree by the shortcomings of the DELPHI checklist to allow a holistic analytic landscape to be constructed against which the reviewer could paint in the outcomes and characteristics of the reviewed projects. It is evident also, in this regard, that a more thoroughgoing delineation of the notions of "innovation" and innovation systems and what they mean within educational arenas has been needed. This will be discussed later.

# Section Two

## Key findings of the projects. Indicators of change

The review of the projects has offered an opportunity to further develop and refine a matrix of indicators that may enable clearer pathways to understanding the uses of ICT in innovative learning in terms of relevant functions and characteristics DELPHI makes no claim to resolving answers to the questions stated at the beginning of this report but it has explored issues that appear to affect the implementation of innovation in learning environments. These will be discussed under the following headings:

*1. Pedagogical factors affecting learning in ICT learning environments.*
*2. Institutional/organizational changes as a result of ICT and e-learning implementation*
*3. Socio-Economic aspects of the innovations*

## 1. Pedagogical factors affecting learning in ICT learning environments

### 1.1 Predominant Teacher roles

New pedagogical strategies and ICT-supported learning were closely linked in most of the experiences yet it remained unclear which of the two triggers innovation in the classroom. The roles of teachers in the projects were not all innovative nor a direct consequence of innovative practice, but there were indications of change emerging from a new understanding of the role of the teacher in promoting innovations in ICT-learning settings. All projects indicated a recognition of the change *from a teacher-centred to a learner centred approach* – a trend not wholly deriving from new technology use. However, it was clearly not the case that this trend made the traditional role of teacher redundant. In many projects the roles of teachers and students remain unchanged. Changing or new emergent roles implies a set of competence dimensions necessary to formulate and develop appropriate training programmes.

Within the tertiary sector this took the form of proposing that instruction of teachers and tutors for handling e-learning courses would be done by starter seminars at the partnering institutions, handbooks for the different roles in the courses and short meta-courses on course-management. Faculty who engaged in the development and delivery of courses at a distance find that the roles to which they have become accustomed in a traditional tertiary or university environment change in the online environment. Such a change would be accompanied by the emergence of *new job profiles.*. Experienced assistants and instructors working in the field of educational media and technology could be invited to give their support to academics in the process of integrating these new technologies.

The role of *teachers as collaborators* of pupils and of colleagues both face to face and from a distance was commonly practiced in all projects. Teachers' collaboration skills and dispositions were identified as crucial: facilitating participation in formal and informal

networks of teachers, increasing collaboration engendered richer interpersonal relationships among the teachers and often minimized power-related tensions that could arise among ICT coordinators and the teaching staff, supported the decentralization of decision-making, and had a positive impact on the effectiveness of the introduction of ICT in curriculum-based activities.

Another identified role was that of the *teacher as a co-learner*, facilitator of students' inquiry, guiding student work and offering individual help; the teacher's role in coaching, observing students, offering hints and reminders, providing feedback, scaffolding and fading, and modelling are further powerful enhancements to any learning situation. The teacher as trainer of other colleagues was also identified.

In respect of student's roles, all the projects observed or encouraged shifts stressing the importance of *active learning*. One project encouraged pupils to become *young researchers* who used new technologies to process, represent and communicate 'scientific' data collected on the basis of real-life observations and teamwork: in another project students assumed several different roles: *recipients, instructors, team and individual workers* etc.

Some changes in the teaching roles have been linked with applications in ICT that can support constructivist and socio-cultural approaches to learning. The role of the teacher as a tutor, observing the actions and exchanges is again, on example.. Teachers as collaborator, facilitator, supporter, coordinator, scaffolder and/or guides of students' work and learning are also common examples.

### 1.2 Approaches and scenarios to e-Learning

Some projects envision e-learning as the system that allows for the distribution of learning materials on the Web, or delivers web-based learning, or provides communication services for the learning community. A broader approach relates e-Learning with activities where innovators integrate existing or new ICT-based teaching/learning products, pedagogic theories and/or institutional and/or organizational strategies and plans into existing educational activities or new activities and/or contexts (new forms of teaching/learning activities or new educational activity settings) which result in improvements in teaching/learning processes and their outcomes.

With respect to scenarios, a typical e-Learning scenario is best characterized as virtual mobility of students, a scenario in which course providers can easily disseminate information about their courses while students can easily find information about courses that suit their interests and needs. A more evolved scenario would be that of providing brokerage educational services, in which several institutions join efforts for offering educational services and courses. A similar scenario would be the market model for e-Learning in which training companies determine customer needs more precisely and offer training services. The goal is, through ICT, to reduce the 'performance time' of learners, enabling them to be more effective, adaptable and employable. There is a need to focus on competence building in a dynamic network of organizations and institutions as a challenge for education and training systems.

A different e-learning scenario would be that of user-tailored CSCL environments for integration into regular teaching under mixed mode learning.

A broader approach is to consider e-learning as a productivity tool for teachers and students: in preparing their lectures, teachers combine various materials from their current research activities together with other used in former lectures and with documentation selected from the Web and reprocessed. The students, on the other hand, are able to pick out information they need, also able to create their individual learning materials. Rapid communications is a key factor among actors and access to resources.

### 1.3 Teaching and learning methods, and devices

Five different categories of integrating technology into learning have been described—exploratory, collaborative, simulation based, drill and practice, and self-learning. In the category of exploratory learning there is quite high expertise, especially in direct instruction. In the category of collaborative learning there is higher expertise in asynchronous methods than the synchronous ones, especially concerning the use of e-mail and discussion forums. In the category of simulation based learning, there is more experimental usage than high expertise, when applicable. However, the methods in this category are mainly inapplicable for a large number of groups. In the category of drill and practice learning, the results show that R&D groups are experts or frequent users of methods that support self-assessment and problem solving tasks. In the category of self-learning, there is high expertise with the exception of inquiry learning, which is basically inapplicable.

Some e-learning projects use combinations of teaching/learning techniques, ranging from the more traditional ones (expository learning) to others with a more active role of the learner (experiential learning, discovery learning, etc). For instance, the combination of expository and discovery learning, together with game scenarios simulating real experiences is an example of this. Learning approaches close to the content scenarios (e.g. knowledge management models) are also mentioned, which offer a closer match between the learning contents and the real scenarios. In these models, online learning tools allow for a rich exchange or simulation of learning interactions.

The socio-cognitive model places the active learner at the heart of activities, with learner control and with learners making decisions that match their own cognitive states and needs: learning takes place in a social context and the forming and reforming of concepts need not only take place at the level of the individual; collaborative group work and sharing with peers and others can be a significant way of confronting one's own conceptions and pre-conceptions, contributing to the perceived need to restructure one's cognitive schemas.

Activity Theory approaches are also becoming present in e-learning. This approach encourages users to consider and reflect on the range and benefits of their existing activities before being thinking about how those activities could be enhanced by new learning technologies and services.

With respect to the discussion on who is the key actor of the learning process, in online learning, the balance between a student-centred approach and a teacher-centred approach remains an unresolved issue, not in the least due to the fact that the discussions on this topic have been focused too much on self-learning as a replacement for teaching. More recently this tendency appears to have been reversed and the debate is now more focusing on the complementarities of both approaches, or on the dichotomy individualization versus personalization of learning.

Overall, pedagogic innovation is a little developed aspect of innovations in education and training. The question is how ICT promotes new didactical approaches. In general the methods that emerge most successfully are those based on more established ICT tools. For instance, asynchronous tools supporting CSCL are quite successful. Unfortunately, some methods have not yet been explored. This might be explained that some methods have been applied only to very specific subject domains -such as law for argumentation; that they demand a lot of resources and high technical expertise of personnel; and that the results from evaluation studies of the learning effectiveness of the application of these methods might not have been promising.

### 1.4 Teacher and student interaction

Through the new communication and interaction technologies, there are new possibilities for communication and interaction between students, between students and teachers, and between actors within the educational system and those outside of it (in museums, companies, schools, governments, etc.). ICT creates numerous opportunities for interactive approaches where students have to react or interact—providing feedback, making choices, and introducing different pathways tuned to differences in styles and prior knowledge.

Many of the projects reviewed contained a similarity of services which were specified as aimed at improving interaction. These services included content and communication services, interaction services (Forum, Chat –in real time, user homepages, etc) and Evaluation Services (Self-assess, examinations) together with Administration Services (Administer course, edit course with on line web editor, edit quiz etc). However, interaction depends not merely on the technology devices used but on the users clearly "seeing" how to do it and why. Building up networked teams by the Internet, with a limited contact or even without any physical contact, has as result an innovative work basis. This implies that *interaction needs to be closely linked to a sound pedagogical approach*, and not solely to the use of possibilities of virtual tools in isolation.

Interactions are rich when students play a more active role. For instance in learning games, student-student interactions are rich; briefing and debriefing sessions in which all, teachers and students, participate. The interactions can be designed in a very detailed way, linked to the roles of the learners. However it is important to say that these roles might be applicable for certain ages, not necessarily for all.

A general observation can be made that the patterns of teacher-student and student-student interactions, accompanied by a shift in the teacher/pupil roles with the use of ICT, change from conventional classroom patterns - where teachers initiated and directed classroom interaction, dominated talk and defined success, to more *pupil-centered, team interaction and collaboration patterns*. In school settings, teacher-student and student-student *interactions are influenced by*

*computer-lab or computer-classroom arrangements* and in particular how computers were arranged in the schools (traditional class, small group projects, or individual work). Pupil to pupil interactions were often based on *small group co-operation*, *collaboration and shared construction of meaning.* In the computer rooms, the pupils were often co-operating two by two or in a small groups, learning to listen to each other and discussing their findings from Internet.

Learning technologies create numerous opportunities for approaches where students have to react or interact—providing feedback, making choices, and introducing different pathways tuned to differences in styles and prior knowledge. The interactions need to be designed in a very detailed way, according to different factors related to context, level, or age. Interactions are rich when students play an active role, for instance, in learning games. Video conferencing, e-mail and the Web create social and educational links: learning about each other, negotiation, co-construction of reports, etc., necessitate rich pier-to-pier interactions and among students and teachers.

### 1.5 Attitudes of actors

Attitudes towards e-learning repeat the patter *technophobia-technophilia* present during decades in the educational system. Instructors often have negative perceptions of technology-supported learning and open and distance learning; they can't see the educational benefits or the potential of new ICT-based methods. They question whether the Internet can actually be used effectively for educational purposes and resist this new mode of instruction.

Observations in regular school classroom revealed that attitudes towards ICT among teachers varied enormously from fear, skepticism and indifference to wild enthusiasm and excitement. Within this perspective, crucial factors in developing positive attitudes among teachers must seem to be the provision of high quality training innovative learning technologies and the encouragement to use ICT in "ordinary" teaching outside the context of projects. With respect to students, one positive attitude towards ICT is that it is perceived crucial for their professional careers outside of the educational arena. Positive staff attitudes to the new technologies help students with the emerging use of e-learning, where pedagogical as well as technical issues arise. Female students' attitudes towards ICT varies. For instance, a project reported that female students were generally less confident than males, and reported fewer skills and lower competence levels.

### 1.6 Teacher workload

It is widely recognized that the workload required from teachers to make effective use of ICT is considerably higher than the one that they are facing in their regular everyday teaching practice. Concerns about workload seems to be a major obstacle at all levels (pedagogical, technological and organizational). There are wide assumptions that the task of preparing an ICT-based course is more onerous than a traditional teaching approach, as well as the integration of new pedagogical methods, however, once teachers engage regularly in the preparation of teaching materials with ICT, the teacher workload decreases.

Feedback and guidance via Internet-services were regarded as essential elements of computerized distance learning. It was clear that many institutions, particularly in the

tertiary sector will require policies and benchmarking recognizing and validating academic cooperation in the setting up and development of educational technologies..

### 1.7 Teacher collaboration

Collaboration is a key word in e-learning. Online platforms offer teachers the online-facility for cooperation : teachers can provide other practitioners with their experiences and offer new modules and ideas for enhancing courses. This does not mean that these possibilities are taken into account in reality. In international settings, it was clear however, that scholars and practitioners, who were well known in their field and to each other and who were used to common and regular exchange of ideas, experience and knowledge, were using the new technologies with relative ease.

Teacher collaboration was also perceived as necessary for creating quality materials. Staff have the opportunity to work collaboratively and closely with colleagues spread in geographically disparate teams. Teacher collaboration is an important part of the communities of practice. Teacher collaboration is also necessary for creating quality in educational materials and courses. Staff have the opportunity to work collaboratively and closely with colleagues who are spread around geographically disparate teams.

Collaboration is a key word in e-learning. The online platforms offer teachers the *online-facility for cooperation* with respect to the e-learning course: teachers provide others with their experiences and offer new modules and ideas for enhancing the courses. This does not mean that these possibilities are taken into account in reality. In international settings, scholars who are well known in their field and to each other and who are used to common and regular exchange of ideas, experience and knowledge.

### 1.8 Assessment

Assessment in e-learning needs special attention as there are many approaches, which reflect different assessment theories. These approaches ranged from the dominant positivistic paradigm in pedagogic assessment, to a constructivist-oriented assessment focused on learner-centered and learner-directed assessment.

In most online learning experiences, types of assessment-workflows were sometimes integrated into the LMS, including formative and summative assessment schemes. Assignments were submitted via Internet, but in most of the cases the final assessment was face-to-face based. In other cases the knowledge was assessed continually, and supplemented by limited formal assessments at group meetings.

There are tensions between traditional curricula and assessment procedures developed prior to the introduction of ICTs and the open, skills-based, student based approaches supported by ICTs. For instance, assignments that have been collaboratively produced need new assessment methods. Individual and group conversations, tasks-based interviews, etc., are assessment methods mentioned. Developing digital portfolios in which students and teachers can bring together experiences, assessments, feedback and reflections that are related to competence building is becoming more and more prevalent.

### 1.9 Affective and socio-cultural factors that influence learning processes

For some, ICT functions as a system that shapes students' lives, learning styles, fashion concepts and social relations and produces a multiplicity of technologies of gender, social class or national identity. ICT ,however, is more than a system of communication and production tools, it is a culture with rules, genres and consumption patterns of its own. From this perspective, affective and socio-cultural factors related to e-learning have a profound macro-social and cultural character well beyond school culture. ICT as a 'cultural' system has a cross-national character and shares many common elements from country to country. Within the schools sector, school culture differs from country to country because it is deeply rooted in the different learning patrimonies of European countries. This universality of ICT culture creates many opportunities for collaboration and sharing which may positively affect learning processes in schools (as contrasted to the national character of school culture). Teachers working with other colleagues online can have different perceptions and understanding. In online learning new opportunities of collaborative work between geographically disparate teams appear. Staff have the opportunity to work collaboratively and closely with colleagues. Students also show enthusiasm in communicating with pupils from other countries which is indicative of the attractiveness of perceived socio-cultural differences to them, something that can greatly enhance learning within many different areas (affective and socio-cultural, domain specific).

## 2. Institutional/organizational changes as a result of ICT and e-learning implementation

### 2.1 Main institutional changes resulted from the introduction of ICT and ODL into existing structures

Universities are undergoing fundamental changes, as sources of knowledge; they are tasked with mass education in their undergraduate programmes. In addition to this, they are under considerable pressure to create vocational streams. Knowledge in itself is not enough, education must lead to employment and the mission to ensure vocational education includes the responsibility for maintaining it and for developing it within a framework of continuous learning. In such a context, information and communication technology (ICT) appears as one of the most appropriate tools, affording the possibility of allowing everyone to learn, when he or she wishes it, whether as part of initial or subsequent learning. Networked and computer-based learning cause initial increases in costs for the organization: costs to develop and deliver online courses, the cost of technical infrastructure (e.g. connectivity, network access, etc.). There are several barriers related to copyright issues which raise questions for organizations, which can include the time-load needed to apply for permission from government entities to create new programmes and market the programmes successful. A successful reorganization process can move the use of ICT as being primarily up to the individual teacher to being a part of the responsibility of schools. E-learning is used to establish research partnerships as agents of change where professional researchers and researching practitioners co-operate purposefully on formulated development targets. In

research partnerships, on regional as well as trans-national level, different actors in the educational system can co-operate purposefully on formulated development targets. Teachers and school administrations have immediate access to up-to-date know-how and are engaged in the development process of their specific school. The institutional context of schools was seen as an important factor affecting the use and implementation of ICT and a major institutional factor is the school curriculum, which needs to be adapted to the new possibilities offered by ICT, and to the labour market. For instance, new interdisciplinary courses might implemented as add-ons to the existing curricula. It was seen as crucial that the courses continued to be part of the school activities after the completion of the projects. The institutional context is an important factor affecting the use and implementation of ICT. In the wider context, there has been a transfer of control of services and resources from the professionals of education to managers from the business field. This has involved a major restructuring of the professional culture, working practices, college management styles and conditions of service, including the employment conditions of the teaching staff.

One example is the concept "learning organization," which has developed to represent innovative behaviours both of productive organizations and of governments and public bodies at European, national, regional, and local levels in a phase in which different aspects linked to the knowledge-based economy, require extensive learning abilities in every kind of organization. The importance of ICT both as a tool and as an end in itself in supporting the restructuring of organizations is widely recognized. The integration of ICT implies change and that its use within education and training is basically a culturally driven process with the need for change in people and within the whole learning organization.

**2.2 The role of Staff training**

Characteristically, teacher training is often assumed to be part of innovations. Any strategic ICT implementation plan needs to consider teacher training, for this reason. The view that the teachers' role changes considerably with the introduction of e-learning based training courses and this change requires tailor-made teacher training in ICT in general and tailor-made teacher training courses in particular is apparent. New competences for professions and vocations that are valued highly nowadays are skills with reference to client centeredness; entrepreneurship; leadership, etc. Education should focus more on new kinds of outcomes and that ICT could contribute to reach this. There are several possibilities that have been identified : developing special ICT based programs teaching these competences directly; integrating competence training aspects in existing computer based courses; creating special places in on-line learning that support the development of the competences described; and developing new forms of assessment that make the competences visible and developing digital portfolios where students and teachers can bring in experiences, assessments, feedback and reflections that are related to the competences.

Teacher training is recognized of utmost importance fro a number of reasons:

a) for developing multimedia materials: New ways of working therefore should be devised which put an emphasis on the exchange of knowledge and skills between different specialists in support of the new pedagogical project. It will almost certainly take a few

years before this changed paradigm can be really put in place

b) for integration of new methodologies: Institutions should re-think their recruitment systems, the on-going training of both academic and administrative staff, but above all their promotion criteria

For teachers and tutors there is a need for training on LMS. There is no general strategy for online teaching and the uniform-ness of e-learning platforms suggests that a given toolset is sufficient for the implementation of any course. There are crucial issues for the successful use of online courses in teacher training which include:

a) learning and working in groups;
b) rich student activities;
c) guidance by tutors and teachers;
d) integration of face to face seminars;
e) classroom and field work examples and tasks.

Online education cannot avoid the need for integration of real contact and field work from local and regional settings. Staff training cannot be limited to the use of the ICT in context, but to the production of learning materials (handbooks, guidelines, etc.). Raising the capacity of the teacher population to use basic ICT applications is but a minimum requirement to ensure that effective ICT-related teaching/learning innovations will have a reasonable chance to get diffused in the body of education.

### 2.3 Main actors, adopters and resisters to the adoption of the innovation as identified in the project

Managers, teachers, students and researchers are seen as the key actors in effecting innovations. Active participation by the students is a clear indication that students in principle tended to become adopters of innovations. Examples of teaching each other and their teachers how to work on the Web and often working on the projects on their spare time, were signals of adoption of ICT innovations. Students did show resistances especially when they lacked computer literacy and technical skills in using the online environments. Teachers ranged from potential adopters to potential resisters to innovations.

Resistance of actors appeared for many reasons: many instructors did not like to learn how to use a new electronic learning environment; they were skeptical about the potentials of ICT for teaching. Lack of technical background, lack of basic computer literacy of the instructors, and lack of technical support were obstacles in introducing ICT in education. The new roles of teachers (from transmission of knowledge to teach how to learn) also threw up resistances. Changing what they think of as appropriate pedagogy for the learners themselves and their subject area may be difficult. This can be even harder when teachers act in isolation from one another and are not exposed to innovative models of learning.

Other pressure groups identified as playing a potentially important role in the adoption or rejection of an innovation in schools were parents, school administrators, pedagogues, enterprises and political authorities. In the school sector, parents tended to exert minimal

pressure to schools. How their demands were taken into consideration depended on local conditions and how good a relationship parents had with teachers in the school. Pressure from administration and political authorities over schools to integrate ICT into school teaching appeared to be universal, systematic, and strong but there was no clear indication if this pressure included e-learning related innovations. Non-economic lobbies did not always share common positions with some against computerization of schools and the tendency towards commercializing education that they believed goes along with it. Conversely, enterprises can be active promoters of ICT adoption in schools and with innovations related to their interests. It would be necessary to define what some people
call a new educational contract between the different partners establishing the rights and responsibilities of each one.

### 2.4 Organizational conditions that are (un)supportive to innovation

The major organizational issues at school level involved the arrangements regarding the placement of ICTs in schools: computer labs versus computers in the classroom. It appeared that the latter solution allowed for more profitable educational activities rather than those held in the computer lab, where there were schedule-planning constraints.

An ICT development plan clearly enhances the capacity of schools to integrate ICT and absorb ICT-related innovations. A detailed technology plan which considers funding, installation and integration of equipment, ongoing management of the technology needs to express a clear vision of the goals of the technology integration. Furthermore, an organizational culture that is characterized by teacher collegiality and formal or informal collaborative work, both supports and facilitates the development of the organization's members. Flexible time-tables, flexible allocation of staff tasks and roles, supportive administration and incentives, are also organizational conditions that support ICT-based innovations In the case of higher education and tertiary institutions, there are a range of key aspects to be considered in successfully implementing e-learning and/or virtual campuses which may include:

1• -Access to local facilities. In a distributed environment making library resources available for distant learners and giving access to e-libraries is an important issue.
2• -Timing: Co-ordination and planning problems may emerge because of learners and teachers working in different time zones.
3• -Registration: Institutions offering programmes across countries should have effective administrative structures.
4• -Payment: Registering for a course usually implies payment.
5• -Security: When all contact and communication between universities, teachers, and students is happening through the web, security becomes an important issue.
6• -Infrastructure/access: students can be frustrated by the computer and network facilities available to them or by features in the electronic tools they are being asked to use.
7• -Financial aspects: Networked and computer-based learning cause an increase in costs for the organization—costs models are required to develop and deliver online courses, and for the costing of the technical infrastructure.
8• -Accreditation/credit transfer: courses attended at another university or offered by a consortium on line may not be accredited in the student's home university.
9• -Copyright – intellectual property: The creative effort of the academic staff should be protected from copying, use and sale elsewhere, keeping the different national legislations in mind.
10• -Competition: Universities face a significant and growing competition from other and new types of e-

learning providers.
11• -Networking: Gives opportunities to universities to collaborate not only on the design and development of courses but also on the delivery of courses, and on Internet or web based education materials and curricula.

When evaluating and implementing virtual campuses, the elaboration of a "map of competencies" that identify and analyze all the competencies required by an institution in order to define, implement, manage, and evaluate a virtual campus from the educational, technological, organizational and economic standpoints. It has been proposed that three types of indicators: structural, practice and performance indicators need to be characterized together with a set of meta-indicators to mirror all particularities of virtual learning organizations. These are:

1• Learner Services;
2• Learning Delivery;
3• Learning Development;
4• Teaching Capability;
5• Evaluation;
6• Accessibility;
7• Technical Capability:
8• Institutional Capability

Within the adult education and school sector implementing and servicing electronic learning management systems was seen as extremely difficult and often cannot be sustained within existing organizations. A very important point has emerged that is related to the need for experimentation and testing and which does have organizational implications. Current e-learning systems and platforms show a wide variety of systems based on different paradigms and emerging standards: most systems have a very specific focus and feature set. The ideal situation would be to develop the whole content and the course structure, devise all tasks for individual students and groups with the appropriate evaluation procedure and then survey and select existing systems and choose the appropriate platform.

The outsourcing of the tasks required is often necessary including the development of content. Higher education structures, whilst maintaining rigidities, however do have large joint information infrastructures which often operate nationally and internationally and have done so for considerable periods of time. In view of the difficulties noted particularly within the adult education projects there seems to be good reason for investigating how large scale information infrastructures could be developed at regional, national and international levels.

On the other hand, "quick and dirty products" – tailor-made interactive assignments - were gaining more and more importance as they corresponded with teachers' needs and approaches rather than highly professional and complex multimedia material, designed for the leisure-time market and not for courses aiming at a qualification level. Copyright issues still seem to be unresolved for teachers and the insecurity in legal terms makes them withhold material they have developed.

On the other hand, most of the projects concerned with schools shared a list of common problem areas associated with innovation introduction which included : school curriculum and time table: schools classroom arrangements: schools' administration: school staff roles:

school culture: Colleagues and parents

## 2.5 Cost effectiveness

Cost effectiveness in e-learning can be achieved through joint working and sharing of infrastructure and by entering into contractual arrangements with commercial and other entities. Within the university and higher technical sector clear analytical frameworks for cost analysis exist in part and this is particularly so with the further development of the joint information infrastructures that most European universities operate collaboratively. This area is extremely opaque for other sectors.

For some, online learning can be at least as cost-effective as face-to-face teaching. Moreover, the development of virtual delivery models will most likely result in a higher degree of cost-effectiveness and a cost reduction. Costs can be reduced through standardization, resource sharing, economies of scale, increased productivity, and by purchasing hardware and software jointly. Additionally, travel costs can be lowered.

When modifying or creating study programmes universities and other educational institutions could save cost be sharing and re-use of courses. Networking of institutions can help in overcoming the problem of professional marketing and sales of their e-learning educational and training services, which is a precondition of reaching the "critical number" of learners, sufficient to cover the cost of development and delivery of quality courses. It may enlarge the 'customer base' of a university and facilitate international promotion as well as acquisition of relevant competencies and know-how from partner universities. Functions such as the development and distribution of learning materials, tuition, assessment, online registration and record-keeping, award-granting, learner support, and general administration can now be shared through a wide variety of organizational arrangements marked by specialization and "added-value" partnerships involving both the public and private sectors. One of the key elements put forward for not investing in new educational approaches concerns costs. That is why an accurate analysis of costs is necessary, although there is a dearth of appropriate cost models. The argument for new economic models to be developed is overwhelming. Proposed direct costs needing analysis includes:

1• -Cost of materials (servers, PCs, peripherals etc)
2• -Cost of software Costs of network infrastructure
3• -Costs of communications Cost of maintenance and updating
4• -Staffing costs (technical staff managing infrastructure and cost of those responsible for the development of projects)
5• -Cost of tutoring
6• -Cost of technical assistance
7• -Staff training costs
8• -Costs of consumables (cables, diskettes etc)

Other indirect costs to be taken into account are time spent by academics learning the educational technologies.

## 2.6 Flexibility

Flexibility was perceived as a key concept and was understood in many ways:

-Flexibility of the tools selected: Institutions will customize Web portals to suit them and furthermore, it will be very quickly alterable to suit differing sets of circumstances.
- Access to resources: Students are no longer restricted to analogue materials in their libraries but additionally have access to the same information through online licenses. Students may thus structure their learning process according to their individual needs.
-Students access: to improve quality of service to their existing students and increase flexibility of access in order to build new markets for their course offerings.
-Curriculum: One major challenge which teaching institutions will face during the coming decade, most especially in higher education, will be the transition from traditional institutions with fixed courses and relatively stable programmes towards organizations where flexibility will be the central element.
-University structure: In the development of new operational model, it has striven to cater to a much wider range of students, and also to implement a much more flexible access provision for these students.
-Course management: Online teaching increases the teachers' flexibility with regard to time and place. Teachers appreciate this, but on the other hand they realized that the online workload is higher.

In schools the use of ICTs have created the need for school administrators to introduce **flexible time-tables** that will allow for interdisciplinary teaching and learning, project-based school work, collaboration among teachers and among schools, informal learning, on-the-job teacher training, involvement of out-of-school experts and the local community

Flexibility guarantees the take-up of innovations within diverse global, national and regional environments. At the micro level, the use of ICTs has created the need for school administrators to introduce flexible timetables that would allow for interdisciplinary teaching and learning, project-based school work, collaboration among teachers and among schools, informal learning, on-the-job teacher training, and involvement of out-of-school experts and the local community.

### 2.7 Accessibility

Access and more specifically online access is understood also in many different ways:

1• -Access to online learning services
2• -Access to a vast amount of knowledge, instead than access trough the teachers
3• -Access of tools as freely available software
4• -Access to training products and materials
5• -Access to information to everybody

Distributed learning can meet the needs of people at a disadvantage (geographical reasons, un-regular working hours, social reasons, special needs, etc). Access depends on the strategy of the innovation. In all cases, it is necessary to increase accessibility by making information about courses and services easier to find and identify.

Accessibility awareness would improve the quality of e-learning for all students, but it is of special importance to students with disabilities. Delphi findings indicate that there is a long tradition for using ICT and online education for making education and learning more accessible for people with disabilities.

# 3. Socio-Economic aspects of innovations

## 3.1 E-learning standards

Content and technical standards need to be adopted that will optimize interoperability with other institutions in areas such as the creation of learning databases, information databases such as libraries, administrative systems and learner support strategies as well as the facilitation of interactions among learners and teachers. Building an educational repository that provides access to learning objects requires standards and structures that can facilitate object storage, retrieval and aggregation to suit the needs off learners or the pedagogical intentions of instructional developers.

There have been moves to produce standards for Instructional Management Systems which have led to a comprehensive set of guidelines relating to the interoperability of computer systems in the educational field. Several standards currently exist in open distance education: AICC, SCORM and IMS for example. They are intended to ensure systems' portability. The lack of definitive LMS standards and evaluation criteria in educational software and electronic learning management systems is still noticeable and makes decision-making very difficult.

Recent growth of products for learning, education and training based on ICT in different countries had led to the use of different names for the same or similar concepts. Interoperability and interchange for the products and components for learning, education and training require a unified way of specifying, identifying and referencing concepts and products, their features and components, by means of a common terminology.

E-learning requires standards: design of a suitable metadata standard that fits the needs of all the innovations while respecting existing standards. There are several international standards and interoperability specifications organizations: ISO/IEC JTC1/SC36 , ADL SCORM, CEN/ISSS WSLT, IEEE LTSC, IMS Global Learning Consortium, W3C, ITU, DCMI Education Working Group , Consensus creation fora , and LOM.

Standardization has other advantages: by supporting the re-use of learning objects across national and subject boundaries, ICT helps learners to appreciate work produced within other settings and promotes a new way of thinking in an environment of related fields and individuals. Localization and internationalization initiatives aim to ensure that standards consider language and cultural diversity in order to improve provision of technology based learning experiences.

However, not everything can be standardized; for instance, an ICT-based simulation game

as an e-learning method is far from being standardized. Standardization should not diminish the possibilities to innovate teaching and learning methods.

### 3.2 Globalization

The "New Economy" has brought many structural changes that have profound implications in industry, occupation, competition, and the dynamics of the individual worker. There is a pressing need for companies to be more competitive, while maintaining a high quality of service and performance. This is being hindered in Europe by a growing skills gap, as the 'time to performance' of our human capital is too long and costly. There is an urgent need to make the current training systems better available, more effective, accurate, and flexible in order to enable true training on-demand services for the individuals and their work-organizations. The competitive challenge is to reduce the time needed to train the Europeans for the jobs of tomorrow and improve their current knowledge base and expertise and most importantly to make this practice of professional development a continuous one.

The e-education market in higher education, has seen spectacular growth in recent years. In the context of globalization, requirements are generated for the development of stronger local strategies and policies as increasingly, knowledge and information become the driving forces behind new social structures. As a consequence the objectives of education and training systems will need to be shaped to cope with the rapid rate of change. Universities face a significant and growing competition from other and new types of e-learning providers. They are undergoing fundamental changes as sources of knowledge; they are tasked with mass education in their undergraduate programmes. In the higher education market, traditional universities not only have to compete more and more with other universities but also with virtual and commercial organizations and companies, all offering the same type of courses. Globalization and international competition go together. Globalization trends and consequences are present in all education and training sectors.

The trend towards Web-based learning models and technology defines new conditions for universities, in terms of finances, staff qualifications, and staff time. To serve the changing needs of the networked world, European universities need to cooperate to reduce costs while responding to the growing demand.

Within the university sector, the Bologna Declaration, globalization, and international harmonization of education influence standardization and course brokering. The trend towards Web-based learning models and technology defines new conditions for universities, in terms of finances, staff qualifications, and staff time. To serve the changing needs of the networked world, European universities need to cooperate in order to reduce costs while responding to the growing demand.

The development of the "new economy" has precipitated structural changes that have profound implications for industry, occupations, competition, and the dynamics of the individual worker. There is a pressing need for companies to be more competitive, while maintaining a high quality of service and performance. There is an urgent need to make the current training systems more available, effective, accurate, and flexible in order to enable

true training on-demand services for the individuals and their work-organizations. The competitive challenge is to reduce the time needed to train people for the jobs of tomorrow, to improve workers' current knowledge base and expertise (promoting "integrated competence building" system, and most importantly, to make this practice of professional development a continuous one.

In schools there is an overemphasis on instrumentalism and notions of "market readiness", insufficient attention to wide general education and deficits to the particular personal/social development needs of educationally and socially damaged adolescents. The new political economy of schooling may well lead to increasing class and sectoral inequalities as funding arrangements change in some systems to be more school competitive and market sensitive and such modern technological aids as IT and autonomous learning becoming increasingly important within educational sectors without compensating resource allocation spread equitably.

What is evident in both Europe and North American is the realization of what is needed on the eLearning front and their effort to accommodate these demands. The learner is moving away from stand-alone courses and is now demanding integrated eLearning solutions with value added services like needs assessment, online mentoring, performance support, etc . The use of brokering platforms is now more evident as the web enables the delivery of information, performance support, knowledge bases and record keeping. Content is becoming more and more important, thus many institutions and companies are cooperating with producers, vendors and portals, and this ensures high quality.

Globalization is one of the key factors driving the new European learning economy / learning society. In the "globalising learning economy" approach, guidelines for a new "integrated competence building" system are needed; competences will be conceived from the viewpoint of their exchange value and also their use value.

### 3.3 Other socio-cultural factors influencing learning processes

Intercultural differences were evident in the projects, especially in international contexts. The main socio-cultural influences between different countries with respect to the use of ICT derives from different aspects: varying cultural and language background, ICT skills and attitudes, varying between universities (so countries), demography, age, gender.

Intercultural awareness can be developed through distributed collaboration as information and experience are exchanged about local environments, structures of institutions and civic and cultural protocols. Multilingual presentations may not present problems at one level but enormous resources are required to transform and translate content into a range of languages. It was however unclear that where partner institutions operated within a limited international range and where there is little previous experience of different cultures how within projects such as these there was enough time for analysis of, reflection on and experience of differing cultural biases.

It was recognized that networking can provide a European dimension, sharing international learning experience in education and training by cross-border delivery of courses. A sense

of community for the students from different countries working together on e-learning projects usually emerges. It gives educators, trainers and learners with different worldviews the opportunity to exchange ideas and information and learn from each other, thus expanding each participant's global view and gaining a broader perspective on a specific subject as well as on the world in general. It helps to develop the habit of intercultural communication for learning and non-learning purposes, so raising tolerance for difference and inter-cultural awareness and broadening or breaching cultural, social, and political boundaries. The Bologna Declaration, globalization, and international harmonization of education influence standardization and course brokering.

In terms of expanding equity and reducing social exclusion in society as a whole, the following groups at risk were listed: Low skilled, ethnic minorities, older workers, unemployed, re-entrants (often female).

Some projects identified different languages of project partners as a major barrier. Europe has eleven main languages and increasing, thus any content should be developed accordingly, while other countries, such as the US, have no language barriers and can concentrate on the development of eLearning applications.

### 3.4 Funding & commercialization

Generally speaking, institutions cannot successfully fund the development and deployment of technology-based instructional management systems and learning tools, except on a very limited basis. Institutional leadership requires that new models for development and deployment of these systems be provided, as the competitive nature of the virtual environment is such that it constitutes a serious threat to the stability and viability of traditional educational institutions. Across all educational sectors the situation is not much different. Many students in upper-secondary adult education usually do not have the financial means for top-level IT-equipment and fast internet-connections. Implementing and servicing electronic learning managements systems (LMS) has proved a task far too ambitious for an average sized school: Running a server with a LMS has to be outsourced and serviced by experts to guarantee a reliable and working system, including a hotline and support for teachers and students alike. The need for a financial plan, gathering funds from both the public and private and private sector is a requirement.

A way to go to the market with e-learning materials is to make a collection of web activities, tasks, and case studies freely available, and to package the full set with the platform that will be required to modify and extend the deliverables. This means that a free runtime version of all software and subsets of supporting documentation should be available. In order to obtain full functionality for the materials users will need to purchase the platform.

For others, a major obstacle for the commercial exploitation of the technology is the non-existence of generally accepted online micro-payment systems. Such systems would be necessary for a pay-per-use business model. it seems currently most promising however to market campus licenses, eventually with the option to convert a certain number of campus licenses into full licenses. The students would pay for the service through the university,

eventually as part of a tuition fee.

However, a growing movement towards license-free open access learning platforms cast doubts about the traditional commercialisation approaches; this would lower the costs for the institutions, and eventually for the students.

### 3.5 Implications for Lifelong Learning

Lifelong learning is a key concept linked to e-learning. Nevertheless there is more literature about the potentials of ICT and e-learning than realities. For instance, it is said that e-learning will enable a close link to be established and maintained between the University, its alumni, and the business world. In this sense the alumni become a vector through which lifelong learning can be promoted, but remains a promise just now. In general it was assumed that the integration of new technologies will enable the university, for example, to position itself in the market more successfully not only at the level of undergraduate education but also in the field of lifelong learning. The introduction of ICT provides strong learning incentives. This holds for both younger and older workers.

Provision of European course portals and acceptance of Learning Object Metadata will support virtual mobility of students due to the fact that they more easily find information about study options available to them. The provision through web-based services can be seen as supportive of lifelong learning because these tools may help to gather and select information that is relevant according to the personal situation.

Among the barriers for participation in lifelong learning are those related to returns on investment in training and learning. The returns on training investments often have a medium to long-term character. In addition, returns on such investments are very difficult to quantify.

The actual use of ICT in daily work is not related to age so much as to the economic and educational background of the learners (the higher educated learners make more use of ICT). Irrespective of age, ICT can create stimulating and motivating opportunities for learning, though it can have a negative impact as well when it deprives workers of the feeling of being in control of their own work. Overall, adult people appear to manage the ICT challenges quite well, acquiring the necessary ICT skills while working.

### 5.1. The perceived innovativeness of ICT

Generally speaking, the projects concepts are build on the notion that the advent of new technologies has affected the sector of education and training in multiple ways which range from the reconsideration of its organization and delivery of services to issues related to cognition and reconceptualization of the relation between learning content and activity structuring. There are many examples and approaches gathered from the projects analysed. Here we have some examples:

- Innovative is the adoption of a learning scenario build out of a game with an improved pedagogical process, obtained by adding instructional support.

- A project must be characterized as innovative, as it focuses on developing and using Learning Object Metadata in a Portal comprising a search engine, a knowledge base, and a authoring interface for international providers of courses and programs.

- Automated composition of personalized books for specific scenarios. For example scripts can be generated that lead the learner from known facts to the selected learning objectives without detours.

- A forum in which students in different classrooms and countries across Europe are able to collaborate to produce a shared outcome that includes designing, building and critiquing working models that they are in the process of building. Web reports consisting of collaboratively annotated multi-media reports and working models also take advantage of agents integrated into the environment to facilitate the evolution of the community's knowledge, as well as automatic 'translation' of the model's description.

- provision of a uniform communication mechanism for a wide range of purposes, including communication between program fragments, collaborative exchange by students of working models and messages, distributed programming interfacing to and from tangibles.

- explore possibilities of technology as a means for the support of active engagement of students, e.g. by learning programming in a game-like way.

- find new ways of representing and expressing scientific knowledge in European communities of young learners

- Support done trough the internet, the results would take after an common business game.

- Metadata specifications, technological implementation plans, evaluation of user interfaces, prototyping, database schemas etc.

- As a communication tool: internet video conferencing to ensure smooth communication

## 5.2. **The sustainability/scalability of the innovations studied**

Sustainability and scalability of many projects has not been specifically mentioned. Or, when mentioned, it falls in the territory of presumptions: "the project seems to be very scalable, but t is too early to tell whether the project is sustainable". Sometimes generic approaches are mentioned: The re-use of existing content promotes sustainability.

Sometimes, specific hypothesis are mentioned: the sustainability of innovation is best achieved when the entire school is involved in the research activity rather than an individual classroom or teacher. Recognized is also the fact that attempts to innovate are faced with tensions which in turn influence the innovation's sustainability potential. There is a consensus that micro-innovations have little chance to survive given the restricted budgets and their low level of institutionalization.

Within the school sector, a great barrier to the sustainability and diffusion of effective ICTs-related teaching/learning innovations is, in general, the lack of reforms that would target the integration of ICTs across primary and secondary school curricula. The analysis of the projects reviewed suggests that the variables that affect the sustainability of R&D driven educational innovations in schools are:

- the nature of the R&D driven innovation
- the nature of the research practices
- the nature of the research knowledge
- schools' attitudes towards R&D and researchers' links with schools
- the time-span of R&D projects
- the nature of the R&D innovation products.

As a conclusion, we can state that the projects look very little for these matters. The fact that are financed by the Commission might influence the lack of interest in sustainability, whereas the scalability is little more than a intention.

## SECTION THREE: Key findings of the DELPHI Workshop, and recommendations

The Workshop took place in Manchester University. June 2004. A number of Minerva, IST and HPHA project coordinators were invited. The aim was to establish a framework for a European-wide discussion among educational stakeholders at the level of research, practice and policy making. The list of participants in the Workshop are the following:

| | | |
|---|---|---|
| **Andrew Haldane** | andrew.haldane@learningfutures.co.uk | **Learning Futures (UK)** |
| **Atle Lokken** | atle.lokken@his.no | **Stavanger University College (NO)** |
| **Barbara Jones** | b.jones-2@umist.ac.uk | **University of Manchester Institute of Science & Technology (UMIST)** |
| **Christian von Craushaar** | | **MCI- Management Center Innsbruck (AT)** |
| **Elleni Malliou** | malliou@ea.gr | **Ellinogermaniki Agogi (GR)** |
| **Eva Lisa Ahnström** | eva-lisa.ahnstrom@bth.se | **Blekinge Institute of Technology (SE)** |
| **Friedrich Scheuermann** | office@friedrich-scheuermann.net | **University of Saarlandes (GE)** |
| **Germán Bernal** | german.bernal-rios@cec.eu.int | **European Commission, DG Education and Culture** |
| **Katerina Kikis** | katerina@iacm.forth.gr | **FORTH/IACM (GR)** |
| **Mario Barajas** | mbarajas@ub.edu | **Universitat de Barcelona (ES)** |
| **Martin Backes** | | **University of Saarlandes (GE)** |
| **Mary Ulicsak** | mary.ulicsak@nestafuturelab.org | **NESTA Futurelab (UK)** |
| **Michael Kuhn** | mkuhn@uni-bremen.de | **University of Bremen (GE)** |
| **Morten Paulsen** | morten@nettskolen.com | **NKI Nettskolen (NO)** |
| **Nick Kearney** | nkearney@florida-uni.es | **Florida Centre de Formació (ES)** |
| **Peter Scott** | peter.scott@open.ac.uk | **KMi- The Open University (UK)** |
| **Peter Mirski** | peter.mirski@mci.at | **MCI- Management Center Innsbruck (AT)** |
| **Teemu Leinonen** | teemu.leinonen@uiah.fi | **Media Lab - University of Art & Design Helsinki (FI)** |
| **Wim van Petegem** | wim.vanpetegem@avnet.kuleuven.ac.be | **University of Leuven (BE)** |

The complete results of the Workshop are gathered in the DELPHI Laboratory, a site for exchange of results and key e-Learning concepts (WP6).

## 1. Workshop Summary: Sustainability; scalability and transferability of innovations

One of the key objectives of the Workshop with the coordinator of the projects and experts was to respond to the above mentioned limitation. In order to discuss and reflect on their in own experience, the DELPHI workshop discussed the sustainability and scalability issue. Transferability was also added given that usually these three concepts are linked in practice, and all need to be part of the reflection on the planning of innovations. Below, we have the conclusions.

The initial point was made that the three dimensions of transferability, sustainability, and scalability are interconnected and that it is difficult to talk about one without talking about the others.

The point was made concerning transferability that a tool can't be implemented everywhere just as it is--local adaptations have to be made to address different needs in different places; in other words, the innovation must be flexible and easily transferable. To accomplish this, a redefinition of educational boundaries is being attempted through close cooperation of programmers and researchers to open up possibilities for change in European school practice through best practice.

Some projects have been promoting open source software and solutions which can help spread up transferability. Perhaps common credit systems, common degree systems, and common grade systems will help make education innovations more transferable. Having common learning management systems could help transferability by making it easier to collaborate and exchange contents. But often it is not the particular learning objects that need to be transferred but the processes that involve similar human processes rather than similar technologies. Addressing the difficulty of transferring intangible things is, perhaps, the key to transferability.

A big issue concerning transferability is the content of the objects. Some see that there is a bigger effort being made to protect content than to share it. This has to be dealt with and it doesn't have anything to do with technology—it's a human problem. Teachers are used to publishing books and getting paid through a publisher and the new model is based on the institution owning the content, and this isn't acceptable to many. Some say, though, that at their institutions this isn't a problem, that teaching staff accepts signing off on the copyrights.

An important aspect of transferability is dissemination and a successful strategy for dissemination has been publication of papers and articles in different languages and different types of publications in addition to project brochures and booklets, in print and available on websites. It is stressed that producing texts in many languages is important. It has been the case that external developers of the software have taken responsibility for the translations.

Another feature that has been developed with apparent success is a best practice community website with a media library where teachers explain what kind of projects they have done with the software. This dissemination should take place at the policy level, the school management level, and the teachers' level.

The problem of quality is, also, a transferability problem--deciding what content is equal to what at a different institution. Transferability needs a partnership of equals and this doesn't presently exist. So, all in all, there are lots of obstacles and barriers that will have to be worked out, though there would appear to be some successes involving many universities working together on networked e-learning.

Concerning sustainability, one strategy has been to create a non-profit organisation that provides hosting administration and technical administration of the portal, which can be used for other things, with hope that it can sustain itself after a period of time. Continuing development has been possible through the use of open source software and making free source code available. This model has been spreading in Europe with strong commitment from partners who are expected to grow in number. Everyone has agreed that flexibility is a key factor.

For some innovations, sustainability has been accomplished and the innovation is continuing on its own through a critical mass of committed developers and users. Consulting and training services for teachers, policy makers, and management are necessary for keeping the innovation alive. A way must be found to link the pedagogical models with the information strategies of schools. Another model to implement is small business initiatives for offering services to schools related to the innovation.

The point was made that there is not enough attention paid to the target population, the actual people one wants to adopt an innovation, the potential users who may not want to be users. Not enough thought is given to problems of learning something new or resistant attitudes. Adequate attention must be given to pedagogy and curriculum, to giving space for realistic preparation and training, to finding out what potential users want and think they need. This is a seriously neglected area.

Another neglected area is the very complex need for new economic modelling. Sustainability requires some kind payment by partners. Perhaps the easiest type of payment would be a work commitment--there is a lot of work to be done. But also there is a need for money for hosting the web server, technical administration, etc. It is important to keep in mind that there are differences within Europe toward getting income and that this is an important issue to address.

An interesting point regarding sustainability is that success could sometimes be due more to the individuals who are running a project than to the merits of the project itself. Also, sustainability is context related; what works well in one context may not work in another. Business, university, and compulsory education contexts are very different. In education, for example, an innovation needs to be somehow connected to the existing curriculum content and organisation of the school.

As for the third area, scalability, an important trend going on within e-learning and online education in Europe today is the move from small scale experiments to large scale use. A problem being worked on is that collaborative learning doesn't scale well. Collaborative learning might be a model better suited to small scale projects than to large online

education. This is a challenge to be worked on. A problem with scalability may be that mass production, a kind of industrialisation, is not popular in a university with a pedagogical environment. Spending a lot of money per student on a small scale project may be feasible, but it isn't feasible on the large scale. Ways to be cost effective must be found.

On the subject of dealing with large numbers of people, there is the idea that a flexible process of working can be scalable--different frameworks can be adapted to suit different courses. An encouraging idea is that, after the first implementation of a course, the cost goes down because you are reusing some material or methods. Some researchers think there is no problem with scales because there are different models for different groups; for example, a large number of students are divided into small groups but a pool of lecturers is one large group.

It is important to see that we are in the midst of a process of evolution, a gradually changing process--there's not one single blueprint. These projects can succeed with real collaboration among educators, researchers, industry, engineers, etc. There are many practical problems that have to be solved, such as copyrights, language problems, quality control and credit transfer. These may be relatively easy to solve. The more difficult ones are attitudinal problems--of students, teachers, and staff members--such as reluctance to change because of fear of losing autonomy and decision making power in curriculum development. It is necessary to built on the successful training modules that have been developed for training teachers in networked e-learning that are continuing to be used.

There is a movement toward linking e-learning networks, so transferability and scalability look promising; sustainability will take more time. There is the issue of standardisation of tools and applications. Not everyone will be happy with standardisation, but in that case, a teacher can still use his or her own tools and applications and have the responsibility to provide support for the students. There had been a perceived need for one pedagogical concept for the whole university to make it clear to students that whatever they are doing fits into one general framework. Even if there is a perception that students want such a standard, many teachers don't want such a top-down approach, so it is essential that the pedagogical framework be very broad. The solution to the organisational problems has been a support team of mixed background to solve all technological problems in pedagogical terms. These ideas are scalable and sustainable with the right tools, pedagogical concept, and support team that are flexible and expandable.

It is important to bear in mind the institutional issues in primary and secondary education. The main problem is that schools tend to be very traditional, not flexible or open to change and innovation. Schools should be the open institution of society, but they are not--there is little interaction between school and society. So this problem has to be addressed, along with making teachers more familiar with technology and making educational technology more attractive to students. These ideas have to get into the schools and everyone needs to understand that they belong, not only to a country, but to Europe, and that they have to understand, appreciate, communicate with and collaborate with others. There has been some progress in collaboration between primary and secondary education and university education with common learning management systems. And when the number of systems decreases, it will be easier as well. The goal is to collaborate from primary school through

secondary school to university level creating a system in all people have something in common.

# 2. Conclusions and policy recommendations

The review and the Workshop have revealed that the dimensions examined –pedagogy, institutional / organizational change and socio-economic aspects, hold strong interdependencies suggesting that policy formulation (and innovation implementation) has to treat emerging new forms of education from a holistic perspective at all levels of education.

The review process, even of a limited and disparate range of projects, has revealed valuable information as to the "ingredients" of new forms of teaching and learning and suggests that there are a multiplicity of issues that have not been addressed.

The DELPHI Consortium recognizes that even though the review process might have omitted parameters and issues dealt with in the case projects that could have revealed valuable information regarding the rethinking of teaching/learning in the digital age, certain key areas of concern have emerged.

In order to validate the results of the review, DELPHI wanted to start with a dialogue on results as well as future actions with researchers and practitioners, policy makers, and with someone from the Commission. That's why DELPHI invited the project officer, some project coordinators and a selection of experts of the wider learning community. We are looking for insights on overcoming problems, constraints and basically for the promotion of the innovation take-up and to elaborate policy briefs: new directions for research and recommendation for future policy recommendations

The Delphi process has elucidated seven key areas for policy consideration:

**1. Teacher Training**

As the role of the teacher and instructor in ICT based educational settings is different from that of the conventional settings, consideration needs to be given to the "appropriate" training of teachers. This has strong implications for Teacher Training Institutions as their curricula need adjustments so as to be supportive to the complementary role of the teacher to the existence of technology in the school/learning institution

**2. Infrastructure Arrangements**

The arrangement of computers influences the interaction process (teacher-learner, learner-teacher) and this finding suggests that the educational planner –whether school administrator or State official, - defines and conceptualizes first the desired interaction model and accordingly arrange the available infrastructure.

**3. Harmonization of Actor's attitudes**

It appears that the sustainability of an introduced innovation in learning (ICT based) is dependent on the attitude of a variety of educational actors. The current state of affairs where instructors/teachers stand at either side of the spectrum – technophobia or technophilia - creates tensions that can be avoided with appropriate planning that involves all of the educational actors. Notions such as knowledge sharing, knowledge production and continuous discourse between the actors make that necessary. Incentives appear to be needed for all actors to operate under the same wavelength.

**4. Assessment**

Assessment of learning outcomes appears to have received a rather low priority in the list of the educational technology supporters. Parameters, such as the development of collaborative skills, recognition and acceptance of the "different", need to be considered besides the prescribed learning outcomes.

**5. Restructuring of the traditional institution**

This is stronger for the higher educational sector – a sector that has received attention, but little has been done for the school sector. An island of innovation does not facilitate the creation of an ICT based culture. All school actors need to be helped (perhaps via initiatives) to establish a dialogue amongst themselves (or be guided towards it) where considered are the roles these play (with emphasis on the power shift that comes from different role playing).

**6. Organizational Planning**

The undertaking of innovation in learning whether ICT based or e-learning appears to be in need of organizational planning. Such planning can start from an ICT/e-learning development plan which ought to encompass aspects of collaboration of actors, time schedules, arrangements for participation, financial issues, accreditation, security et al. Particular attention should be given to cost effectiveness of the initiative and indications of its sustainability and scalability. New economic models are urgently required

**7. Socio-cultural Issues**

Although the promotion of ICT in education and its spin-off notion of e-learning is done in the name of providing equal opportunities to all, as technology from a technical perspective is capable of giving equal access to all, the cluster of projects reviewed do not provide strong evidence to this effect. It appears that the socio-economic parameters of and for ICT based/e-learning have not adequately been researched so as to provide an evidence base of its role in the structuring of our learning systems. (This might be a deficiency in the methodology of this project.) This is perhaps the area that the policy makers ought to consider the most in the formulation of a research policy regarding e-learning.

The ***learning society*** has been discussed in terms of innovation and competence building with social cohesion. Innovation is viewed as the key process that characterizes a

knowledge economy when understood from a dynamic perspective, while competence is the foundation from which innovation emerges and allows many innovations to be applied. Contributions occur to both the "generation" of innovations (on the supply side) and to the "utilization" of innovations (on the consumption side). Learning is reflected in improved skills in people and in the generation, diffusion, application and usage of new ideas. Learning thus can be an unintended consequence of experience and augmentation of scale, as formalized at the single entity, regional or national level. Learning to manage a large portfolio of loosely unrelated knowledge accessing distributed knowledge and leveraging it all in a rapid and interconnected manner into new learning products and solutions is a major challenge for all sectors of society.

The knowledge base is becoming deeper in cognitive dimensions and much more complex and requires a diverse competence base not all internal to a specific entity. In this regard, among other things, the process by which knowledge is created within innovative groups will mean that constellations or bundling of new skills will emerge with different distributions of explicit and tacit knowledge and different patterns of distribution of knowledge and skills between different individuals in different environments. This will interact with the fact that different systems of governance will often dictate that different patterns of tacit knowledge emerge in, to take extreme examples, large bureaucratic organizations as opposed to small market-oriented organizations. This applies equally within education as in other sectors.

## 3. Areas for future Research

There is need for a diversification of actions in education to support the creation and diffusion of distributed knowledge bases. This is particularly appropriate in the context of the digital divide for *catching up* countries and regions so that growth and innovation spread will not just be based on the creation of new sectors but on the internal transformation of sectors that already exist – by exploiting their distributed knowledge bases through adequate incentives and institutions. With the co-evolution of technology and education and utilizing what are the outcomes of our analyses it seems not inappropriate to recommend that overall new **development models** need to be defined, researched and applied which recognize that among their component parts are required:

*a) radical redefinition and diversification of teaching methods and training of teachers*

*b) stronger understandings of how to create institutional strategies within educational entities and the skills to effect that*

*c) embedded effective cost analyses of technology/pedagogy interfaces*

*d) realistic planning for sustainability and scalability of innovations*

*e) mechanisms that inform on state-of-the-art developments particularly in standardization and generic education and training vocabularies*

These component parts, as in any development models, are crucially dependent on shared knowledge and experience. This carries implications for the emergence of truly effective trans European "knowledge pools" and further for the design and processes through which researchers and practitioners seek support from funding entities to research, test and apply their innovative ideas.

The review processes have revealed a set of indicators that require the attention of the education planners and education actors in general and suggest that the new forms of educational provisions –whether viewed from a user or provider perspective, require a rethinking of what teaching and learning now constitutes. The indicators identified may play a benchmark role in the conceptualization, structuring and operationalizing of what we term in the broadest sense, e-learning. The results of this analysis indicate that fundamental changes emerge in the transfer of knowledge at all levels whether school-based, in higher education or in adult learning. The transversal nature of the indicators of change – whether these address the issue of roles or organizational conditions, invite the policy maker to, upon a reflection of what was to what is and what will it be, articulate policy(ies) that can be supportive of ways in which to maximize the effective transfer of knowledge to the wider possible populations.

# ANNEX 1

## Transcripts of the Workshop presentations and discussion
**Manchester 07.06.2004**

**NOTE: ALL THE PRESENTATIONS ARE AVAILABLE AT THE LABORTORY SITE: www.ub.es/euelearning/delphi/laboratory.htm**

### Time: 9.35

### Welcome to the workshop from Dr. Barbara Jones and Dr. Mario Barajas:

We would like to welcome you to this workshop. UMIST, the University of Manchester Institute of Science and Technology, will disappear in September 2004 and become part of the University of Manchester, bringing to an end over 150 years of history. This will be the last opportunity, then, for many of you to visit UMIST. Before we start it would helpful if people could introduce themselves. Mario Barajas will then speak to us about the DELPHI project. Thank you.

### Introduction by the Participants:

**Peter Mirski** :**Management Centre Innsbruck,** an Austrian University of Applied Science. He is responsible for the graduate programme in management and applied informatics,

**Christian von Craushaar**, member of the **Management Centre Innsbruck** staff and works on the DELPHI project.

**Mario Barajas Frutos**: coordinator of the Delphi project. He is a staff member at the **University of Barcelona**, in the Faculty of Education , Department of Didactic and Educational Organisation. He has been involved in different EU projects over the last 10 years, always in the area of applied learning technologies.

**Germán Bernal**: **Desk Officer** of the **European Commission**, Socrates Minerva Programme and responsible for the Delphi project.

**Peter Scott** from the UK's Open University's **Knowledge Media Institute.**

**Andrew Haldane** from the private consultancy company **Learning Futures Ltd**. He is a partner in the K2 project, which is an accompanying measure to Fifth Framework programme projects, in particular those related to web based management.

**Barbara Jones:** Senior Research Fellow, European Work & Employment Research Centre**, University of Manchester Institute of Science and Technology (UMIST)**. She is involved in a number of European projects. She is a partner of the Delphi project.

**Mary Ulicsak** from **UK NESTA Futurelab**. She works on how technology can be used to improve learning.

**Morten Flate Paulsen**. He is director of development and professor of on-line learning at **NKI** , a private education institute in Norway. He is a member of the Delphi project

**Atle Lokken**: Norway, is the manager of a development team for elearning, which is not serving students, but basically staff. He is involved in research and production of courses.

**Teemu Leinonen** from **Media Lab, Helsinki**. Media Lab is a university of art and design. His research field at the Media Lab in Helsinki is related to ICT. He is also involved in European projects and in particularly with the ITcole project.

**Eva Lisa Ahnström** from **Blekinge Institute of Technologies**, Sweden. She is part of the 5D project that is focusing on technology, pedagogy and psychology .

**Eleni Malliou** from a private school in Athens, Greece. She works in the research and development department of the school, which has been involved in a number of projects dealing with the introduction of ICT in primary and secondary education.

**Nick Kearney** works for a private Spanish educational institution, **Florida**, which provides education in all the sectors except primary education, including education for the third age and post graduate and university degrees.

**Friedrich Scheuermann**: **Saarland University**, Institute for Computers and Law, whichis the university department which is in charge with ICT implementation and the legal area. He also works in the department of education. His expertises are in the pedagogical field, in the area of online courses for many years, and he has participated in several EU Projects.

**Martin Backes** works with Friedrich Scheuermann and is responsible for the technical part of the Delphi observatory.

**Kathy Kikis Papadakis** from the **Foundation of Research and Technology** in, Heraklion, Crete. Her interests are primarily in the implementation of technology based teaching and learning. She is a partner in DELPHI

**Michael Kuhn: University of Bremen**, Department for Political Research. He has coordinated a number of Framework 5 Projects. including the "Euronet" project which has analysed the impact of European integration and enlargement on education policies.

**Wim van Petegem: Katholieke Universiteit Leuven**. He has been part of the Netcampus project together with Europace, a network of about 40 European universities working together on the introduction of ICT in higher education.

## INTRODUCTION TO DELPHI by Dr. Mario Barajas:

Delphi is an elearning project approved in 2000, under the Second Call of the 5th Framework Programme. The aim of Delphi is to create an observatory of elearning practices based on the review of thirty projects funded under a number of EU programmes.

Three key programmes were selected: IST, Minerva and Improving Human Potential (IHP)Socio-Economic Research projects. Many of the projects have already been completed, but some of them are still running, especially those from IST. Delphi wanted to look at these projects with the aim of searching for approaches to innovation in respect of practice and pedagogical approaches.

The key point of Delphi, in the sense of creating a knowledge base of innovations, is to set up an observatory of elearning innovation and elearning practices. The aim of this observatory is the dissemination of innovative practices, providing documentation and elaborating indicators of innovation. A secondary goal is to establish a laboratory which would be a collaborative network of researchers providing a common place for discussion and exchange between people interested in elearning innovations.

We selected a list of 18 Minerva projects, most of them already completed: 8 ICT projects and four IHP cluster projects dealing with the socio economic area. The Delphi project was informed by previous work, done within the socio-economic research area by the Merlin project, which analysed five cluster projects. That project has now finished but we applied a similar philosophy to the analysis of different European projects. I think we got a good representation from the quantitative and qualitative point of view of projects and programmes. All of the projects are related to this broad area of elearning or ICT learning innovation.

The focus of the analysis is based on three axes. We were looking for pedagogic innovation, for institutional and organisational innovation and for socio-cultural and socio-economic innovation. We have not concentrated particularly on technology, which would be another dimension of learning innovations and of ICT.

The analytical approach involved the use of qualitative indicators as we believe these might point to relevant changes in learning. These qualitative indicators are present, they are part of the projects, but they are not easy to find, or they are not necessarily well defined in the projects. Often they can not be well defined within the projects. If this were the case we would have used quantitative indicators. Since we are dealing with innovations we preferred to look at the approaches used in the projects. This certainly needs some kind of reflection and definition. So these qualitative indicators of change form the three main areas of the discussion.

Qualitative indicators shape the innovations by investing them with characteristics that could be found in related innovations that occur in similar contexts. What we are trying to find within our analysis are characteristics of innovation through these qualitative indicators in order to not generalise all the learning situations,.

Within the pedagogical dimension we found interesting changes and indicators of change. We concentrated on those indicators that seemed the most interesting ones or the most important ones. We were looking at changes in teacher and student roles, at new learning scenarios based on any kind of elearning practice, at new teaching and learning techniques, new methodologies or new didactics related to the use of specific devises. We wanted to link technologies and methodologies: new ways of interaction between teachers and students or students and students, changes in teachers workload. All these problems have been pointed out many times as have new ways of teaching collaboration and new ways of access.

Within the institutional, organisational dimension we were looking at the set of indicators. We should say that these indicators come from reviewing the literature on one hand, but on the other from the projects themselves. We have different indicators based on what we have found from the analysis of the projects. For instance, in this area, we found that institutional change resulted from the implementation of ICT into the existing structures of the educational system or of the educational institutions. Staff training is an important criteria that deals with institutional development as well. We have not been dealing specifically with the training itself, but with the plans for changes in training within the institutions, based on the needs of ICT.

We also searched for the actors, adopters and resistors to innovation or to the adoption of innovations within the institutions. Organisational changes and organisational conditions that we found in the projects, are good examples of being supportive or unsupportive to learning innovation. Further, we have been dealing with the problems of the flexibility of learning settings and the accessibility of learning in different ways.

Within the socio economic and socio cultural aspects we are talking about important factors.. Socio economic aspects involve the discussion of elearning standards, the issues of globalisation and the use of new elearning organisations. Other socio cultural aspects are for instance language and language problems within the framework of globalisation.
A further point was funding and commercialisation: what are the consequences of decisions on the funding of elearning or on commercialisation. We looked at the implications of elearning, ICT learning from the point of view of lifelong learning, which opens new opportunities for adult education, post graduate courses etc.

Finally we have been concentrating on a kind of synthesis at the end of the project, of what was considered the most innovative aspect for us and for the projects. What were the specific rules of ICT in the innovations. What was the most important role of ICT, if any, because many times ICT is just something added and not innovatory.

An important issue which we would like to discuss in this workshop are the problems of sustainability, transferability and scalability of innovations. We want the workshop to focus on these three key aspects. On pedagogical aspects, on institutional and organisational aspects and on socio cultural and socio economic aspects of innovation. These dimensions are interconnected. In fact it is difficult to talk about one dimension without saying something about another. They are very well connected, all of them. We would like to hear more about what are your experiences and what you think is important on the issues of transferability, scalability and sustainability - from the viewpoint of your experience, either from the project for which you have been invited or from other projects related with ICT.

We want to start with a dialogue on the future actions of the observatory and the laboratory with you as researchers and practitioners, policy makers, and with someone from the Commission. That's why we invited our project officer and representatives of the wider learning community. We are looking for insights on overcoming problems, constraints and basically for the promotion of the innovation take-up and to elaborate policy briefs: new directions for research and recommendation for future policy recommendations.

Before this workshop we sent you a document, which was a kind of a discussion position from our point of view. I hope you all have had this document and have read it. I just want to recall some key questions that we posed to you in this document. They were related again to the sustainability of innovations for the projects to be sustainable and for having an impact in practice.

Should we engage in applications that have the possibility to be applied on a larger scale, or are we mostly interested in our own applications? What is our approach to dealing with implementation or research in ICT based learning? These are some of the problems behind the scalability.

Are there intermediate strategies between large scale information and particular information that finishes when the project ends? How could we define good transferable practice by providing strategies for applying the results, in terms of examples and quantified research results? Well these are the questions. You don't have to answer them at all, but please keep in mind the issues of sustainability, scalability and transferability within your other experiences in the projects you have been dealing with.

## PEDAGOGY SESSION ONE: Introduction by Friedrich Scheuermann:

We asked Nick Kearney and Atle Lokken to contribute the experience they have from projects they are involved in from a pedagogical point of view.

## Presentation about 5D by Eva Lisa Ahnström:

The following presentation will give you some background about what we have been doing for the last 3 years. The project finishes at the end of July, this year and we have been going for a little bit more than three years. It is in the Fifth Framework ICT programme under the action line *school of tomorrow*,. We have been looking at how to use ICT in a way to make pedagogic changes in school.

This is 5D in a Nutshell, it is about cooperation and about collaboration between different groups. Teachers, pupils, assistants, students and researchers work together and one main thing that we said is "What I can do with others today I can do by myself tomorrow".
You learn through communication. This is nothing new in pedagogy, but 5D is very deliberately worked within a model of how to work in school. We have been working with different age group as well as assistants and teachers. . It's not that only the small children learn in these settings, but also the assistants. They don't learn the same, but they learn. A teacher of course also learns all the time. 5D is very rich in communicative possibilities. To have excitement, motivation and fun is very important when you work with 5D. Of course when you have fun you learn a lot more. So what can you do in the 5 D activity. We tried to create environments for learning, but it's also a way of organizing a structure in the learning process in a reflexive way. To do this it is very useful to use ICT based tools, because as a teacher you are concerned that your children achieve what is said in the curriculum. That is one of the points that we always have to look at.

You can't just come to a school as a researcher and say: you should use this. We think it's fun and children love to work with it and here is a computer programme and the teacher asks "Ok, but where should I put that in my time frame, in my curriculum, because I have to educate the children this and that ?" When we work with 5D we structure the learning process, so the teacher in a way has control. The keywords are exploration, creation, imagination, play and reflection. It is very important that you reflect also about what you have learned.

It is very much inter-institutional, inter-generational, inter-cultural. You work between institutions, you work between generations and you work between cultures and different cultural settings. We have been working in Barcelona with a gipsy community there. It has been very much about teaching the children how to read and write, a literacy project, but also to adapt them to the environment and to the society around them. It is also a research laboratory for the psychologists at universities, so it is situated between the school, the university and the children.

Here are some of the tools and the artefacts that they used in 5D activities. Tools are in all the 5D activities and ICT is a tool. What you do is more important than what tool you use, but ICT tools are very beneficial. We often use a maze in 5D activities and the maze is a way to structure the work. In the maze you can find task cards and then you can think of problem based learning. This is very much like structuring programme based learning in another way. You can go from different rooms in the maze, and when you have solved a task you can go to another room. There are different levels in these tasks, so if you choose to do that task that is marked as good, then you can choose between two rooms in the labyrinth. If you choose to do the more difficult one as an expert, and everyone in the group knows that room 20 is really exciting and everyone wants to go to room 20. Then they try to struggle a little bit more and do some difficult tasks.
The journey log is something that the assistant, teacher and the children do together and that is a way of reflecting what has been done. So they sit down by the end of a session, write on what have they have done today and then suddenly comes the magic moment, when they together find out that they really learned something different, that is outside the curriculum as well. 5D labyrinth is something we have done inside the project. It's a good way to share tasks with other teachers, other groups, to share, to be able to work, children can work with each other even if they are not in the same school.
(slide 5)
The goal of the 5 D project is stated like this: To support development, learning communities and also to

promote new forms of collaborative learning in schools. We talked a bit about 5D as a change agent in schools, able to change organisations and structures.

As to the outcomes and what have we done. Of course we have made a web portal. In this web portal you can find some educational software, a collaborative platform, support for network and we have done this with the University of Barcelona, the University of Copenhagen, the Blekinge Institute of Technology and TicTac and Paregos, which are two companies. Paregos works with programming and TicTac more with interfaces for computer software.

So what's new, what's so special. So here is the web portal. It's based on open source, it's a CMS system and that makes it rather easy to administrate and to add information and to add tasks and different artefacts. You find examples of all the activities and you find the starter tool kit, if you want to start your own 5D activity. Labtools, that is collaborating with the administrative tool. You have areas for collaboration and for sharing. We have a "my 5D group" where you find contact and support and of course you also find static information.

The Education software is the 5D Labyrinth and the 5D Labbuilder. Here you can see the administrative tools. In 5 steps you can build a mission and when you have done that, you can go into the labyrinth and work with it. It's not extraordinarily technical, but it's rather innovative, since it is so flexible. There is also the possibility to make a total local adaptation. It's not something that is already done, but it is more a framework that you can adapt to your own local settings. You can reuse what others have done. You can also use it in other contexts. Paregos, our programming partner has shown this to other companies and they are very interested to use the framework for adult learning settings as well, with some changes. Further the tool is translated to other languages than English, so we will have it in English, Swedish, Danish, Spanish and perhaps in Catalan.

The collaborative platform is something called "My 5Dgroup" and it is a closed group, local or global. You need to be a member to use this collaborative platform. We of course have a forum. The 5D artefacts, and something that is called 5D Kit, are spaces where you can pick artefacts and look at what others have done. Different kind of task cards, mazes, journey logs, and you can add your own, if you are a member. If you are not a member you can look at what others have done.

The support for the network is a main issue, but we have a network that was already existing before the project. 5D existed before our project and it will continue to exist after our project as an idea, as a model. So this network is not connected to the portal. Also teachers that have now started to work with the 5D model are available for contacting through this portal. So, it is now possible to create cooperation activities together, perhaps for a short time or for a period of a couple of weeks or even longer. We have university courses available, net based university courses and you can also exchange your learning material. In 5D you work together, its not a stand alone model and the collaboration is very essential. If you have a look at the tools, it can be difficult to understand what you can use them for, and that's why we need to have the support within the network. When you are at school working with 5D, you are never just one teacher, there is a whole group of persons for this learning process. You can find theoretical net based support, person to person and also a lot of information and literature that you can go through if you want to have a more theoretical base.

The specific value is the local praxis. We don't believe that you can implement a tool that can be used everywhere as it is. We believe that you need to make local adaptations, to address different needs in different places. And it should be very easily transferable. That is what we have been aiming at. It's flexible, in many ways. We are trying to make a redefinition of educational boundaries, to open up possibilities for change in European school practice through best practice. The development of what we have done has been done in close cooperation with programmers and the researchers. It has been a quite long process, just going back and forward, back and forward, so we wouldn't be hindered by the technical possibilities. We didn't look at the technique first, we looked at what we wanted to do. And then went to the technicians. We all worked together with them. So the development has been very much collaborative.

As for the sustainability we have created a non profit organisation, that actually is continuing to exist. The network was established before, and it became stronger thanks to this project. The hosting administration and the technical administration of the portal is secured for a two year period after the project ends. It's the university where I come from that thinks that this portal and this applications can be used for other things so

that they have promised that they will sustain it for two years at least, and then we hope that a non profit organisation can take it over. Continuing development is possible because we have used open source software. The "labtools" are not only open source – we have the free source code available for non profit organisations. So within non profit organisations we can continue to develop this labyrinth.
We have a very strong commitment from the existing partners and we have identified potential new partners that may want to join us. The model has been spread in Europe and we had a successful validation in 50 schools, in Belgium, Netherlands, in Israel and in Sweden. And what they have said is that the best within this model is in fact its flexibility.

So this is what it's all about. It is about all this groups that are working together and it is about people and meetings and the portal. That's the base where to meet and make the contacts.

**Question by Morten Flate Paulsen:**
*You have secured administration and funding for two years, but you need some sort of income to remain sustainable. Do you see any way to get income from this concept, from this commitment, from you as an institution?*

**Comment by Eva Lisa Ahnström**:
That's one of the reasons why we call this a non profit organisation. We can more easily search for new funds, search for partners and search for a sponsoring body. We don't think that the portal itself should bring the funds. We want keep the portal open and so we decided not to take any fees from people that want to use the portal . That was one discussion we had. So its definitely the sponsorship that might help. Within the non profit organisation this is one issue that we need to take care of in order to become sustainable for the long run. For the moment they promised two years and that is good enough, that gives us some time to find other sources.

**Question by Peter Mirski:**
*We are trying to create a laboratory for the Delphi project and you said that your project is a sort of laboratory, a virtual laboratory between the universities, the schools and the experts. Could you just give us in one or two sentences to how you structured this process and what makes this process sustainable.*

**Comment by Eva Lisa Ahnström**:
It's the neutral interest from the university to be able to have a real live laboratory. It was their initiative, and then we have been cooperating with some schools for their project and with the University of Barcelona as they have seen the advantages. Of course that means that you have more adults in the classroom. It's very simple.

**Question by Friedrich Scheuermann:**
*Did you identify obstacles you had within the structures?*

**Comment by Eva Lisa Ahnström**:
When you are working with schools you always have two big obstacles and that is time and curricula. You have to do it within the ordinary time frame of the school. People need to start working in a more collaborative way.

**Question by Friedrich Scheuermann:**
*In the Delphi project, when we did analyse the cases we identified that teachers are confronted with new issues they have to do. The teacher workload is a key word which we identified in many cases. Do you personally think that this 5D model is a model which has the prospect to be introduced for education in Europe.*

**Comment by Eva Lisa Ahnström**:
Yes, not as taking over all the education, but as part of it, as a new way of working. We have written about that, I think it would take to much time. Please have a look at the project web page. www. 5d.org

## Presentation of the Media Lab and the ITcole project.Teemu Leinonen:

I come from the university of art and design, Media Lab in Helsinki and we are a department of the university of art and design.

I thought that first I speak about the institution, since most of you probably don't know it and about the learning environment process in our department. Then I will go through the pedagogical approach which has been, I guess, the main reason for asking me to come here. Afterwards I will talk about little bit about the research and development work as a process we have been working on in Itcole project and a little bit about the resources and then what's going on in 2004.
We finished about a year ago and need to be going forward this year and will go on. I will show you that the Itcole project is sustainable, at least at a certain level and we are still working on the best things going on after the project.

But first just shortly something about the media lab and the learning environments research. The university of art and design is actually a quite old university. Its 130 years old. We talk about product designs and productions. Through the schools you can see what kind of things we do. We have the film school, which is the only film school in Finland at a university level education in film or motion picture. We have the industrial fashion or object related design at educational level. We have the department of art education as well. All Finnish art teachers are graduated from our university. Then visual culture, which is the graphic design for the graphics. And the media lab which is the newest school in the university. We are quite international, at least in terms of Finland. 15% of our students come from abroad. Actually more from outside Europe than from Europe. From Asia, China Japan, Korea and also from south America. The media lab has its tenth anniversary this autumn and we now have interdisciplinary MA programmes.

We take students with the backgrounds in computer science, in art and design, in education, for instance, my background is in educational science, and I also graduated from the media lab. So we try to bring together people with different backgrounds to work on digital media. We have had doctoral programmes as well, since 1996 and research groups since 1997.

We have quite small departments, with about 120 students and we take 20 students every year. Staff members are 40 people and external funding is 50% coming from external sources, which means industry and the European Commission. We have both, national and international sources of funding. Through external funding we finance the research work, the MA programme is founded by the Ministry of Education of Finland.

So all in all we are a laboratory. We want to emphasize that we are laboratory, which means that we make experiments. We even do various kinds of commercial productions. Quite a lot of new media companies in Finland can be found in the media lab, in our department and we have a lot of these spin off companies coming from our department as well. We encourage in our work, collaborative learning or collaborative work. We talk about co-design, or participatory design. We emphasise that creativity is reflective practice in a way. And also the usability and accessibility issues, designed for quite important things in our activities.

The media lab is focusing on learning environment research. We have been working in this field since 1998 and we have the slogan, that we are "theory based - design orientated", which means that we base our educational theories, mainly on the psychology of education. The cognitive science, but our results as a research group are not necessarily papers or study reports. We do quite a lot of prototype scenarios and software which can then be used in the real situations. Of course the ITcole project has been our biggest work in last two years, then there is the fle3 environmental software which is still part of the ITcole project. Lately we have been working as well with the UNESCO for a young digital creators programme, and now we are working quite a lot with the mobile thing, thinking on how to use them in situated and collaborative learning. We have a national project starting now about this issue. And then one new area, which is also a kind of spin-off from the Itcole projects, the "learning Objects for progressive inquiry". I will tell you a little bit about the progressive inquiry which is kind of result of ITcole project as well.
So then to ITcole project and after a few words about the consortium. We were having in the consortium quite strong pedagogical research from psychology of education. We were having partners form University of Amsterdam, Utrecht, Rome, Salerno and Athens and University of Helsinki as well, all coming from the

background of educational science and psychology of education. So we have this strong pedagogical research in the background and then we were working on technology development with several technical partners. We had a user, which was the city of Helsinki, the department of education which was our partner in the participatory design process, by working with the schools, mostly with the teachers on the design process.

So in that sense, even if we were focusing on technology, we first developed the pedagogical models of collaborative knowledge building and of collaborative learning for European education. Based on this research work we were developing the knowledge building environment, and fle3 is the one environment for collaborative learning on knowledge building. Then of course the third part is to evaluate, test and disseminate the model and the environment. So they go hand in hand: the way of teaching and learning and the technology which has been developed.

So first of all we are developing models and practices, we are relying on web based technology, as it is web-based software tools we are developing. At the very beginning we decided that it must be open source and free software, because the schools have low investment possibilities to try out new pedagogical models with new technologies. They shouldn't make a commitment for a year or even for a shorter time in order to try out something that is new for them. It should be free or low cost for schools to try out and see if it works in their own environment.
The general idea was that at the end of the project European educational institutions, especially the schools will have an opportunity to adopt , deploy and develop further the web-based educational platform along with guiding pedagogical models. We were doing software which can be distributed, you can download it, you can set up your own server, you can modify it if you want, but you are not left only alone with the software.

This has to be a kind of starting point for us if we are thinking that we are working in the Information Society and believe that that's what we are aiming to. What are the skills needed in 20 years time . I think , that we must focus on knowledge and especially on students skills in order to cultivate knowledge or create new knowledge. It doesn't help anymore that they are able to go through some instructions in their own work-life. They need to be knowledge creative in a way and then we get to the collaborative way of working with the knowledge. Of course the creativity part is important when you try to create new knowledge.

When it comes to the e-learning discussion, ICT and learning, I would take away everything which is in this red frame (see slide). We are not interested in this, we don't talk about computer based training or that tradition which is from the 1960s . No real web-based training, no e-learning or freedom of time and space, no distance learning, not this untiring teacher idea through real impact if the real impact is with the computer, no cost efficiency or any management issues related to learning. What we are focusing on is that computers are student collaborative tools, which is, if you think, also the tradition of living together with the computer. Samuel Proppers once said that computers are tools that will help people to solve things which they can't do without. They were in the tradition of seeing computers as a cognitive tool for people to go beyond their cognitive skills by using the computer. To use the computing power of the computer to solve problems, and then when we come to the network computers then comes the collaborative and network learning aspect. I really don't want to talk about e-learning at all

A few words about pedagogical approaches in the project. Student-centred learning, collaborative learning, cross curriculum projects, are where the students are working. I will not talk about those, but just a few words about distributed expertise, progressive inquiry and knowledge building, which might be not that common.

The idea about distributed expertise is that there can be a distributed commission, socially and physically. First of all socially we can overcome limitations of our cognitive skills, by working together. We can share the problems and solve problems together. More complex ones than those which we can work on just by our self. And then, very important when it comes to the use of ICT, is the physically distributed commission, that we can divide into the commitive load to the external tools. In the community, to the heads of other people, but also to the external thinking tools or cognitive tools. Traditionally notebooks and blackboards, so why not computers. A computer is actually a quite powerful cognitive tool if it is used in a clever way.

The progressive inquiry model is a learning model which has been developed partially in the ITcole project. Actually it has been developed earlier in some doctoral. research, but then we were implementing and

developing it further in the ITcole project. I will try to explain this idea. The students build up the context. This is of course done by the teacher who will give the theme or the topics on which the students have to work on. Let's say it can be on some of the courses or test sites we were working on. It was the internal row, without defining if it is history or geography or art or something else. Its just about Rome and then the students can have a look at the videos related to Rome, the history of Rome and the culture of Rome.
But after bringing up the context, which is done by the teacher, the students are free to set up their own study problems. They define what kind of topics related to the context they want to study. One study problem in this example was, why there is the saying that all roads leads to Rome. I don't understand where that saying comes from. So this is a study problem students worked on. Now we come to the use of computer. In this instant we can share these things through the computer, so the students will report their study problems into the database. Normally this kind of progressive enquiry may take four months of working on one topic or one theme. After four months of working and presenting your study problems and getting deeper into the topic, you have quite a lot of information. So actually you need a computer to organise this, to be able and available for further reflection, and for having a look at where did we come from and where did we go to. After the study problems, we tried to model the scientific research process. After the study problems the students have been asked to present their own explanation of theories. And in this example "why is there the saying that all roads lead to Rome" there was an explanation by one of the students that : "I guess that maybe the Romans think, that they are the centre of the universe. They have been coming up with this kind of saying. So that is a student explanation, which is based on the existing understanding of the topic. And it's really important that their own explanations, own theories also get stated somewhere, where you can go afterwards and see, if they did have any learning or conceptual chains as we call it.

Some student knows a little bit more of the topic, some student may have an evaluation of the hyper thesis of theories and then this critical evaluation and explanation leads students to search for deepening knowledge. They can use all existing sources of information, their study books, their school books, internet of course, cd-roms and of course, the teacher as well.

After this kind of work, the students study problems may hopefully become more focused. They provoke non defined problems as well and what they adopt during the process is something that can be called "new theories". They are new theories for the students, because the earlier theories where their own explanations, own beliefs they where holding and now they have better theories which are probably closer to the scientific explanations of the issues they have been studying. Where we need the computer is when the input is put in the database, which is shared by the students or the whole community of learners working on that theme. So afterwards, in the database you can have a look at what was the student "John" first explanations on this problem, or what was the deepening knowledge found by "Ann" during that learning process. So for reflection of the students on learning and of course for the teacher to follow what's going on we need a computer to manage the information which is actually created by the students during the learning process.

Questions and explanations derive from the users own understandings and the scientific information found. We need this tools for working with knowledge objects., like explanation theories, hyper thesis and interpretations. These knowledge objects are things students are creating during the learning. A similar way to the way of experts working with knowledge, presenting explanations and theories and verifying them. We also need these tools for monitoring the learning process. And now with this monitoring I don't mean the teacher monitoring the students, but the students monitoring themselves. The monitoring of the learning process as a community.

I really believe that we need this kind of consortium when we develop technologies for schools. We need that pedagogical research which should be done with schools. We need design which is quite often left outside, which should be done with schools and then with the technical development.

For this kind of circle we were working on, we were of course having the requirements, in the specific case an interface design which was made with the teachers and with the schools, then we made the system development immediately or testing an evaluation with the schools in the project. At the same time we started the dissemination and exploitation. All the people or whoever, was actually free to try out our resource too.

We released the software as open source together with our results. All the pedagogical models are on the web as well. On the software development side we were implementing the extreme programming model, which is

user centred, participatory design method for software development. In a way we think of the role of the teachers and the schools, I would call it a consulting or action research we were doing with the schools. Intervention with the technology to the practices of schools. And the teachers were writing user stories for us. We were also having collaborative design sessions. But what is really important to emphasise, is that this is a consulting process. It's not that the teachers are ordering features for their own use. That's not the point of participatory design. It's a dialogue between the developers, the researchers who actually know better than the teachers what is good for them. Then you find out the consensus in the community, and then you can get to the new level. Its not that user centred design doesn't mean that you do what the customer is asking for.

There is a relationship to the national polices of ICT in schools, in a way that technology development can be part of the schools IT services. In a similar way as they have email and web sites and so on. Actually the software can be installed on many different levels. You can install it on the teachers' computers and build up the learning community in there, which is actually a quite nice solution, because it's also a secure network for students to work. Well if you want to work with a different class and with the same server, you can install it on the school server or you can install it for the school district level or the national level if you have some collaboration between the schools, which is not necessary in the point of view in here. We don't talk about distance learning in here. So it's a free and open software with open standards and interfaces. You can also integrate it with other systems like student management systems. At least in theory, it's quite open for different kinds of modification. Of course it requires technical skills which probably do not exist in all schools.

By doing the project we made more than 80 collaborative learning projects in Finland, Greece, Italy and the Netherlands, in primary and secondary school levels. We were focusing on the school level. And then in another EU- ICT project they have been working on with more schools in other countries which were not participating to the ITcole project.

Now some words about the results and the disseminations. We have been producing quite a lot of papers, articles about the pedagogical models in several European languages and in different kinds of publications, scientific and more on the level of general interest as well. We have of course the project brochure and the booklet which I think are quite important tools for dissemination. We have been publishing teacher training and consulting models that can be implemented. At the moment only in English, but it is available in our website and schools and school districts, ministries of education may implement this kind of model of teacher training or consulting of schools and introduce progressive inquiry and the software in use.

On the side of the software this free and open source software will be provided for downloading and also the other software, which was developed during the ITcole project is for free use in schools. Our partner "Frauenhofer" is hosting the free service for schools . At least at this point. The fle3 has been translated into more than 20 languages already, and this has been done by the developers of the software, none of the translations was made by anybody who was participating to the ITcole project. They all come from external developers. It is in use in more than 30 countries. Actually we don't know exactly how many places it is in use. Hungary and Portugal they are introducing the fle3 to schools in their own countries. This has been done by the ministries of education there. And the software has been tested in hundreds of institutions in Europe but also globally in many countries. We also have a certain best practice community web site with a media library where teachers explain what kind of projects they did, or they have implemented with this software. There is a quite a lot of textual descriptions of school projects related to the use of this software, of progressive inquiry and these learning models. We work a lot with the European School Net which is an initiative of the European ministries of education in order to disseminate results on different levels. I think that this requires dissemination at the policy level, at the school management level and then at the teachers level. There are a few pictures of the fle3. This is the Chinese version and …

Then finally the year 2004 and beyond. Where are we going. There are some business and sustainability models which we build up, based on the results of the ITcole project. There are some service providers of the software and there is the developer community which is committed to develop the software further. So in a way, when it comes to fle3 it's been leaving us already and it lives its own life, which is I think a good result. We don't need to worry about it anymore. It will continue and there are developers working on it and there are users. So we have reached with fle3 a certain critical mass of developers and users and it will stay alive. There will be some initiative for providing consulting and training services for teachers, also consulting

educational policy makers and managements. We need support for teacher networks and of course in developing of school curriculum and something, (I don't know if this is the European term), the school information strategy which in Finland the ministry of education is asking to each school to prepare. We have to link the pedagogical models with the information strategies of schools. So there are lot of things going on afterwards and there is a sustainability, at least one year afterwards and I'm wanting quite a lot for hopefully small business initiatives where little companies are offering services for schools related to fle3, hosting it, but also providing the pedagogical consulting and teacher training for the local schools. That's the model I would like to see in the near future.

**Question by Nick Kearney:**
*Do you know anything about the process of the adoption in Hungary and Portugal?*

**Teemu Leinonen:**
I just heard about it two weeks ago. I got the information from the European school and I don't really know what kind of levelling is done and what this means for fle3. But I think that they are starting some kinds of teacher training programme where the fle3 will be used as a platform. So I think in the first place it's a teacher training programme.

**Question by Peter Scott:**
*You said a little bit about scales and the system of scalability you have been working on. One of the biggest problems of the UK Open University is getting systems to scale up from 10 users to 100 users to 1000 users. We have 200.000 user. So any time someone logs onto our network it is becoming a serious effort.*

**Teemu Leinonen:**
It works just for technology. Like for the NASA or for the biggest web portal of Brazil which has millions of users. It is scalable if you buy more hardware, but we didn't really think about it, because as I said, we don't focus on distance learning. Actually I'd like to see fle3 as a database in a classroom. It's a classroom elearning database. So in that sense, scalability is not that big an issue. All I know is that the city of Helsinki is hosting a service for their own students. They have 70.000 students in the schools and its scalable for that.

**Question by Mario Barajas:**
*This is a good example of media planning theory. I'm interested in the pedagogical model. .Where do you think the possibilities are for other countries to introduce this kind of system, or who are the resistors you find in the educational system to introduce such types of innovations. Are they related to the teacher training, are they related to the call, organisation , educational organisations or to the curriculum?*

**Comment by Teemu Leinonen:**
I think that they are related all at this aspects. We are working at all different levels, in Finland and in Europe.

## Presentation by Nick Kearney:

I've got some bad news! The word elearning is going to be dropped. We are doing a project where we talked with SMEs about their use of ICT for learning and we are finding that everywhere we go they think that elearning is what comes on a CD or maybe across the web where the student sits alone and is fed with content. And that is what elearning is apparently. But I think that most of the projects we are talking about, these presentations we had, are in a completely different mindset. So we seem to have a kind of schizophrenia in the world of elearning as a bunch of people who are very, very, very good at marketing and very good at persuading people to adopt their solutions. A bunch of people who are doing absolute wonderful things and some perhaps think that these wonderful solutions are so wonderful that they will be taken up, because they are wonderful. And it just don't happen. That's not the way things go in the world. The wonderful solution stays in an environment where it works perfectly and in some books, we have created within our institution. The hard part is not persuading the enthusiasts, the early adopters, but the hard part is persuading the teacher who can see the interaction, the use of this new idea, but can't quite see how it's really implemented, how it really gets introduced into practice. And nothing is really done about that. And I think, what you were saying, about the Commission goes right into the proposal forms. The proposal forms have innovation in a box, and

disseminations are in another box. And now slowly but surely uptake is actually coming in the proposal form, but it should be there in the innovation box. Innovation. Is that an add-on to R&D? Maybe the definition of innovation ought to include take up. Innovation in a corner is not innovation, there are other words you could use for it. It's not useful, it makes you feel good, it may be very interesting, but innovation, and that's exactly moving into main stream education, isn't really of any use in the corner. So you need to think about the usefulness of your innovation before actually starting to do it. I visited a conference when I was in the Basque country the other day, where we were all from secondary cooperatives, which means cooperatives that are groups of cooperatives. And we were talking about how we use ICT for training in our organisations. The first talker was from the group Eudoxa, which is a big elearning organisation and its fame is that they are quite successful, especially in marketing. They go to conferences and talk about collaboration, participation etc. etc. And they very skilfully incorporate that discourse into their sales. And this guy made the slickest presentation. "Yes we have participation, yes we have forums, yes…". And then you actually looked at the outputs , and yes they actually got a forum in the corner there, but it was the same product with the participation added on,
Everybody wanted to do it the collaborative way but they were having enormous problems working out how to get away from that enthusiastic first moment wave. You know you want to do, but you don't know quite how to make it happen in your organisations. And I think the problem is that we think too much perhaps about everything except the actual people having

to adopt it. And that teachers, the teachers with the workload that has been mentioned. But its interesting, it says teachers workload. What about the learners workload. We have a project, I'm not going into the projects that I've been involved in, but there is one called Ikarus, which is an online course in teaching and learning by using collaboration as the basic philosophy. And we had the same problem. They loved it, but it's a voluntary course, voluntary means it's interesting, but it's not one of my work priorities, and they get so involved, that the workload that we said, always increases, because they want to do more, they want to get involved in all the conversations that are happening and so very often you find people who are marginal, who have joined because they are interested, but they have a lot of other things on. They have to stop, because they cannot keep up with all the conversations that have been generated by the learners. We work with five pages of text in a four weeks course. We are not generating all this amount of reading and I think it's the learner that generates it. And that's something that needs to be taken, as a kind of apart from the teachers face. How do you prepare learners for that shift, that change.
I think that one of the problems we also find there is that learners aren't used to it either. Collaborative learning to collaborate. Learning to participate is problematic and difficult. Many of our students aren't mature and participating in learning requires a maturity and very often perhaps the main obstacle to uptake are those people and the fact that they are not ready and that the curriculum does not give us the space to prepare them for this kind of learning. So that's another thing that perhaps needs to be thought about, like we need to think about training people in ICT skills. Lastly I think you need to think about pedagogy and organisation the way that you create space for the innovation to grow up.
What you talk about with the enthusiastic early adopter you find a space to fit the use of it on a particular group. That's fine. But what happens when they talk about that to another colleague, and that colleague doesn't have the space, how do we give the space. In our organisation we have developed an approach which involves concentric circles of conversations between teachers and giving teachers as they come into those increasing circles space to experiment.

**Comment by Atle Lokken:**

*Just to emphasise, our major concern is not the innovators at our institutions. We can't control those people anyway, but our major concern is that the major group of the staff is also becoming a student, basically as you brought it up. That's our main focus in the future, because that's the new business. Actually it is a new business to perform some innovators because much of those projects and initiatives, they never end up … There is a balance between, in my way, the class room experimentation and the management implemented strategies.*

**Comment by Teemu Leinonen**:
*Well I must say about comparison of technologies, that you shouldn't use Power Point at all. But you need to prepare the level of the skills, because if they can't handle the Microsoft products then how could you expect them to handle something else.*

**Comment by Atle Lokken:**

*I'm not a technician myself, I'm a media-scientist which is something to meet in sociology and I'm always managing a staff of engineers, but I'm the one that actually promotes the ideas of the engineers to the staff and I see this is a new profession in the academic community. Most of my time is actually marketing.*

**Comment by Barbara Jones:**
*Atle's last point, about a new occupation or profession is very interesting and it is a development we need to be very aware of because it tells us something about change in the educational world(and elsewhere). What is also intriguing me is that, listening to your interesting presentation, you talked about a particular kind of epistemology a particular kind of methodology, of inquiry, which isn't unique to use with IT. I don't like terms like elearning, because the use of it seems to separate this area off from decades of experience gained in education and training. We need more effort to develop methodologies which help us combine technology use and existing pedagogic practice. We need to know what it is that people are actually learning. when they go into "cyber space" because it is perhaps not what*
*we think it is. We have certain assumptions ourselves, because of the way we were trained and educated but there is a whole generation of young people now learning and perceiving in new ways. A further issue to think about is that technology means we can crosswalk much more easily into many areas , to leverage information, to capture data. .But we are still talking about what kind of methodology/ies to handle that. Is it best done collectively?*

**Comment by Nick Kearney:**
*What you say is correct, nobody is inventing new pedagogies in terms of absolute focus there. Very often what happens there is that technology allows you to do things that were less feasible. I think it's actually hard to get what the skills they will need, ten years on, fifteen years on, because the technology is moving so fast. What I'm saying is, we can't know. But we have to prepare them to be able to arrange themselves when the time comes. And somebody seems to talk about digital natives. They suggest that the ways in which people think and understand will change in this generation. And in certain ways the older generation will be unable to comprehend.*

**Comment by Teemu Leinonen:**
*There is a match between the scientific process and the use of technology. I think that's really important to know. We are now seeing that the schools are more and more into scientific work and actually learning that the scientific process is very important.*

**Comment by Atle Lokken:**
*When I have to talk and sell to the buyers there is the question why. If I can convince those people that this is better than what you had before they probably want it. And in a part of history there will be personnel problem basically for the staff that wants to take this into the classroom. It wants to be a technology problem, it won't be a teacher problem, it will be a personnel problem.*

**Comment by Nick Kearney:**
*The problem of blue sky, type research and marketing is that marketing should be available, seeing what users need first before you do something else. But that's impossible with blue sky research, which is supposed to be free of those kinds of constraints. Once you got something you have to look at it from that point of view. But it seems to me that again the problem we mentioned earlier in the context within the institutions is a European problem. There is nobody around who will do that, who will play that role in terms of for example the framework. That horizontal transfer has be done actively, it won't happen by itself and there is no one around to do it.*

**Comment by Andrew Haldane:**
*The Sixth Framework is going a little bit more towards blue sky, than the 5$^{th}$ framework. The 5$^{th}$ was a sort of bluish sky in applied research, but I think it's an interesting point and in particularly if you look at what the market is being offered. It could be because they have been flogged the wrong stuff so long and they don't like it. I think, when you are looking further ahead, the users have never seen the art of the possible. So you are right, it can't be an issue that you need to have social people a bit more ahead of the art of the user. Often people in the research community, are guessing to some extent what users we talk about, as it is usually the case of the research framework project. It's actually working, but with quite small groups of users so that you can't get the perspective through a kind of intuitive process.*

## SESSION TWO: Socio Economic themes introduced by Barbara Jones:

We ought to start this section now which has been organised by the DELPHI coordinator under the heading of socio-economic and transversal issues. We can continue with Michael Kuhn's contribution followed by two presentations . I hope this section will contribute to the critical discussion later today on issues about lifelong learning, exclusion, elearning and generally the notion of eLiving, which many national governments and the European Commission are attempting to foster.

## Presentation and Comment by Michael Kuhn:

On the user - the user is apparently someone who is not using something, that's why he is stressed so much to be the user. I'm not using power point and I can promise you my colleagues have tried hard to persuade me that I should become a user of this technology. And they have tried hard by persuading me of the incredible fascinating possibilities I have using that kind of software. I refused, not because I didn't find that software fascinating, but because I find that the power point presentations are bad presentations. It's not that I'm not fascinated by the technology, but I think it devalues the quality of scientific discourses. Why? Because it tends to simplify complex and complicated issues into a kind of headline thinking. And I'm very worried about that. It also tends to seduce the attention of people to something that is very visible. And as soon as these power point presentations start to touch on something more than just linear edited headlines they often use something else, also very fascinating, but very poor. You have these images with dot here dot here dot here, and a lot of lines or arrows connecting them. But the interesting thing, of course, is what is the content of these arrows and lines. That is of course what the power point presentations cannot do. I don't want to exaggerate with what I say, of course you know a Power point presentation could give you some quality points to remind the presenter of the kind of things he wants to present. That's true. But it tends to simplify what people want to say. Interestingly Atle, you left your presentation when you said the things you were most committed to and you started to talk completely without this kind of simplified structure. So why do I say that? I find your discussion quite fascinating about the user. The user is a strange animal, the user is the creation of a person which, for the hell knows why, does not want to use those fascinating technologies which you created. That's the user. So the user is a non user. That's the problem. But I think the reason for that is, that you think, sorry for that generalisation, but the problem is, the people that are creating these new technologies, they try to persuade people, as my colleagues with all fascinating options this technologies provide. But the problem is that it's hard to persuade a user of the potential in the technology and of the technological possibilities such a technology implies.

What about turning the thing totally the other way round. An interested user does not exist in your reflection. And that's the needer, if this animal exists. Who is the needer? But you prefer to talk about the user and the user is a construction of something where the technology exists and you ask afterward: how can we persuade that animal to use the thing that we have done? Without asking him before: you really need that? And I have hundred of stories, about these technology failures. The same as you just said. In my university we have implemented a computer based administration system. It is a disaster. Not only for me, but also for all the people working in the administration department. I'm coordinating EU projects, so you know what our administration people do. They do all the administration on that computer software, they do it, because they have to. And in fact you know, this heavy books? They have these books, and they have sheets of paper where they do all this calculations with the calculator. And if the boss is coming, they fit it all in the computer, but if you want a real question answered, like " how much money you have for travel cost" they look in their books!

You know more about these stories than I do. So the dangerous thing, I think, is if you like, the needer and not the user, but the needer is also a very problematic category, because the needer is per definition a conservative construct. The needer says, well you know, I need what I have, but you want to persuade him to use something new, to create a need for something new. So that's also a sort of tricky relation. But I just mention this, because we have in fact done something totally different in our company measure project that I have been coordinating during the last two and a half years. And this was about the questions: What do

we need? What do we want? And more precisely we have raised the question: What do we want from the project Europe?

I will be more concrete. Since you know, European research is supposed to be applied research due to the fact that the project Europe is a project under construction. It was our intention to look at current and recent research projects, with respect to the question: What have these projects contributed to construct Europe. And in particular we have selected projects which are, lets say, in the field of educational research or we use the term learning related research, for certain reasons which might be quite obvious to you, because education has a strange connotation in some countries. So how does European research continue to construct or to conceptualise Europe? We have looked at projects, and we have tried to find out for example: how is the European citizen constructed? Who is that? Who is that kind of European animal, that colleagues use in EU research projects when they are talking about this kind of things what we are talking about here for example. Who is that elearner ? Who is that person? What kind of assumptions are behind the construction of this kind of creature who is in your context an elearner? We have also tried to find out what are the concepts of knowledge we are using in that kind of elearning debate. What is knowledge, and it's obvious then, that there is very tricky relation between knowledge and information and all these kind of things. What is learning? And also what is working in these concepts and what is the relation between learning and working and last but not least what is living like in this kind of society we are supposed to be in. Is there a living besides learning and working? And you know very well the whole discourse on a broader level in Europe, about the future of the project Europe. I don't need to mention this famous Lisbon summit about Europe becoming the most competitive etc. etc. There are also a lot of assumptions about living in Europe, what is Europe, what is it to live in Europe, and we wanted to find out what kind of assumptions and concepts do research projects use when they talk about Europe and when they talk about living in Europe and when they talk about the citizen and his life. It is obvious that this debate, as you all know, is very much dominated by the concepts of employability, which is a kind of sub-concept of an economic driven concept of Europe. In fact the Framework programme six, which no longer talks about the European society, but talks about the knowledge based society and introduces very interesting concepts about Europe which have a lot of things quite suddenly to do with what you are discussing here, because another major feature of European education or learning research is that not just by coincidence, it's called European learning or European education research and European does not mean that it takes place in this area in a geographical sense. It is also supposed to find answers to the question how to integrate these traditional societies. Don't forget that, we just had D Day, where you know we just remind ourselves that it is not such a long time ago we were throwing bombs at each other, we hated each other like mad. If you listen to the interviews, you can really see that both, the Germans, the British and the Americans, they really wanted to kill each other. They really hated each other personally and were really moved when their friend died next to them by a German or the other way round. The previous German Chancellor, Helmut Kohl, has said about the project Europe: the alternative to the project Europe is war. Very interesting observation. So I'm saying that, because the way the project Europe, the learner, the subjects, the citizens are discussed within this environment of, lets say, elearning. I'm a little bit worried, that all these considerations are suddenly completely deleted from the agenda. That is quite natural, because you know technology is technology and it doesn't matter if a German is typing on that keyboard or computer or whatever. That is true, but you have to be aware that this is just an extract of our reality, using that kind of technology and the human beings we are dealing with are really more complex and wider then just elearners. They are more. And it was our intention to find out what are the ways, the learners, the subjects, the Europeans are conceptualised in the European research community. So that is what we have done. This is going to be published in our project results which are in the process of publication. . I would like to make a little final remark. I'm very much aware about what I was trying to say, and I was not very well prepared or not at all prepared, because I wanted to respond to the discussion here and not just make of make a sort of presentation on this project. I'm very much aware, that what I'm saying could be sort of easily misinterpreted as some sort of normative or even moralistic or the new version of those kind of fascinating things, and I don't say that with any sort of irony, but we must be aware that we are dealing with subjects, even then or also when we talk about elearning and all the kind of things you have presented. People are more than users of technologies. It's always a sort of risk and
danger that when dealing with these fascinating technological options, it limits our view, or sort of conceptualises the people we are dealing with to only the little part of their lives we are referring to. This is not a sort of moral contribution or ethical contribution, it is a scientific contribution, because it deals with the questions - who are the subjects, the learners we are dealing with. The user for example, who is that? Is that a correct and complete picture or image or maybe also is that a complete reflection about the people, the persons we are dealing with, as they could working more or less in the field of learning education etc.

**Comment by Mario Barajas:**
*Thank you Michael for that l contribution, which reminds us of the complexity of the environment we are talking about.*

**Comment by Teemu Leinonen:**
*I think you are quite right, but I think that this idea, that technology is value free serves the markets and all the good designers know, that it's not. When you design technology, you also design the user. You have the conception of the user and the situation the user is living in. And for that proposition, good designers have methods. There is participatory design which is for instance done with the users in a community where the technology is implemented.*

**Comment by Nick Kearney:**
*I think the point in question is not just about getting into other organisations, but very often, just today hearing different peoples experience. Hearing for example talking about the two years down the line in Norway. I don't think that's the same in Spain. I think in Spain it's six or seven years down the line and I still have people saying to me. Latin people don't use computers. I think that's nonsense, but I think some people really like talking and on the other side what I'm saying, the take up for transfer is a cultural issue as well and it's about looking at the specific environment of the place you want to transfer it to and contextualise the innovation. This needs a serious analysis that they aren't used to do.*

**Comment by Michael Kuhn:**
*We had a really fascinating communication tool in one of our projects and we had a technology freak who was perfect. You could communicate just what you did with anybody at any time and it is fascinating, but you know what happened in our project? Nobody was talking to anybody, not because they were too stupid to use the technology, they didn't want it, because they didn't know what they should talk about. So why should I ask a question to that guy in England? Because I don't know what to talk about. You can use this incredible communication tool and you can even call him on the toilet, but if you don't want to ask him anything, the communication stays quite poor. And that's what happened in this project. We have invested 10.000 Euro for the technology. I always said stop that nonsense, but I couldn't, because the technology freaks were stronger. Because it was so fascinating and then, at the end, it was really waste of 10.000 Euro for nothing, because people didn't know what to talk about. And after that they realised that there wont be an interesting point to talk about.*

**Comment by Barbara Jones:**
*If you just take a simple technology the email. Email is great, people send emails to each other, but usually they are not very reflective. For me, it doesn't substitute for the benefit of sitting together or working on a document together. This is my experience, interesting or not? In the Delphi project, we send lots of emails between our selves, but the truth is our best feedback is when we meet together.*

**Comment by Eva Lisa Ahnström**
*Sending an email is so easy, it's that person and that person you really want comments from, but it's so easy that you send it to everyone. All the persons in the world and then perhaps you don't get the feedback from the two persons or they don't see the mail because they are overloaded. So that is more of a way of learning how to use that media. Before perhaps you sent a letter instead with an article that you wanted someone to comment. A letter in paper. So that's because we have this tons of emails. I think it's more a matter of that we are still learning how to use it properly.*

**Comment by Wim van Petegem**
*I'm not sure if I can agree with your comment on email. From the student point of view, I'm not sure if email is not a better communication tool than for instance oral communication. And if you use email in a proper way, then you have students to reflect about. And they formulate their thoughts. So in such a way that I'm sure that if you use it the right way, email can bring added value to the communication between students and teachers. So I wouldn't exaggerate too much about the bad use of email. Also if it is in an international context, for instance, and you need to communicate, or students need to communicate with other students in other countries and in another language then the difficulties are lower by using email communication than other oral communication because they can sit back and think how to formulate a message. So we have seen*

*a lot of interesting use of email communication in the international context. I completely agree, it's not an substitute, but it can bring added value in the communication.*

**Comment by Michael Kuhn:**
*But that is not the argument. The argument is not if it's good or bad, the argument was that the in fact fascinating options of this technology is contained. It is not necessarily something that is really useful for certain uses. That was the argument.*

**Comment by Mario Barajas:**
*But in practice it's complicated to decide. I mean in terms of history there are lot of examples what the needs are of the users and what is really needed. I recall this anecdote of people using telephones at the beginning of the twentieth century. There were very few people in the cities starting using this stuff and people were laughing about them. "what are these people doing, using those stupid things etc." So many things have been built by technology and by real need on the other hand. There is almost a balance between what is emerging in society and what the real cultural needs of the people are.*

**Comment by Michael Kuhn:**
*The thing I was worried is as you say it is a bit more complex in between different factors and I just wanted to be a little bit annoying here, by saying: Selling technologies with its fascinating technology or technological options. Is one point, but you should not be surprised if that fails, because there are other aspects.*

**Comment by Andrew Haldane:**
*I think if we talk about the socio economic impact of EU investment on elearning, . I know for certain that there are very large scale, very interesting projects going on in the central England at the moment. I know for sure that, as sure as anyone can be, that those projects wouldn't have happened if the Economic Development department of Birmingham city council hadn't been a partner in the 4th framework project called Domitel.*
*Now there isn't anybody actually active in those two quite large initiatives now. If anybody went to those two quite large projects and said, where did the ideas come from, what convinced people, sort of two stages about down the chain, you have to put budgets together and make investments, but this sort of things should go ahead and nobody would trace it back, but it's down to people who are budget holders actually seeing the excitement in the faces of some quite small groups of learners of people who are coming back to learning and being exited by new ways of learning. Somewhere down the line, budgets are set aside, there are models that have been passed of one to another. And it's just a little example of what you can trace. And I've learned from being there.*

**Comment by Atle Lokken:**
*I learn from being here but I believe that we need to abandon some technology because we need to play around with this technology. The SMS wasn't invented by the users. The SMS was a technology that was actually invented by some technicians in the lab and they didn't know what to use it for. But it was employed by the needers or whoever and they had a market perspective that was quite surprising. They didn't even know that there was a market on technology. So I believe we need to abandon some technology. Lots of stuff you are drawing out of this, I think it's great and I don't see the use here and now, but if its sustainable, someone will find a use for it. Our forefathers had it for the telephone, the steam engine or the new technologies. They are the same, exactly the same discussion. People even believed that to go riding on a steam engine you will die because of the speed.*

**Comment by Michael Kuhn:**
*To be honest I mentioned all the other things, but you know the steam engine is a bit tricky example, because we all know it has played an important role, but you could mention all the other things that disappeared.*

**Comment by Atle Lokken**:
*I think we need to abandon some technology and we can point at some technologies in the later years that don't exist anymore like the beeper for instance, anyone using a beeper today?*

**Eva Lisa Ahnström**: *Yes I do….*

**Comment by Atle Lokken:**
*Well, it's a dying technology. But when it comes to email, I think its true. Its just a matter of finding the use. I actually use a lot of email and I come from the industry myself, just last years I have been working for the university. In the project work I use always emails, I don't like using telephone, because the email is traceable and we work with clients. Its actually legally binding what's communicated in the email. So I said my client: don't call me, mail me!*

**Someone**: *Can't you record it ?*

**Comment by Atle Lokken**:
*Yes, like the insurance companies. If you call an insurance company they tape your phone call ,but I don't do that with my phones and that's why I prefer email. And there is another reason, which is actually one of the characteristic of the internet. That's the independence on time and space. You shouldn't forget that. You don't have that in any other media, independence of time and space. If you use technology in the right way, then you also see the potential, but if you try to copy what you are doing here then probably the technology will fail. Its something new. You have the use for something new.*

**Comment by Peter Scott:**
*I just wanted to say that what we are talking here about are a lot of things. We ended up talking about things like email and power point and we are supposed to be talking about innovation. What innovation is about is about change. About changing something that exists into something else that should be better, but it is also about risk, because there is also the risk that it isn't better or that the thing you are trying to innovate with, wont do what it says on the box. Innovation is about changing something and I don't think, you can change a system that isn't ready to change in some way. And it's not the technology that really changes, it's the systems change, users change and if you got partners in an EU project and you don't know what to say to each other, you need to change partners, because its not the technology that doesn't make you talk to each other. If they have nothing to say, that's the problem not the technology. There are really interesting studies on this. We did a huge study in a hospital where we put in a whole slew of innovative technologies for nurses to use and to become knowledge workers. And it failed miserably. The technology was brilliant but the nurses simply didn't want to. They were not prepared to do this. We know the technologies are brilliant because we did exactly the same thing with a bunch of midwives in exactly the same hospital. Nurses versus midwifes. And the midwifes really wanted it. It completely changed everything they did. Which is a marvellous result. The culture is ready for change, the culture is hungry for change, the culture wants change if it's ready. You give it to another culture that doesn't want the change, you are wasting your time. You need to get the culture. Culture has to be right here. Just to say: maybe the innovations we look here aren't the right ones, not because they are not the right technology, the culture is not right.*

**Comment by Mario Barajas:**
*I think email is an innovation, I mean its an old technology. We write our students ourselves etc. Of course its not a real innovation anymore. I wanted just to say something about email. The academic world and the business world is absolutely dependent and you say that you use emails because its bounding. Messages are administrable etc. Somebody in my university told me the system he uses to manage his email. He never ever reads his email. Only when the people who sent him an email ring him, does he realise that there is an important message that he received by email. So it is a very cultural way to see technology.*

**Comment by Peter Mirski:**
*I just want to add something to what Peter Scott said and this is also a kind of understanding the Delphi project. We are looking to things which are alive not at innovations as such, because I do believe there is no innovation as such, but it is in the real setting. I wouldn't say email is an innovation or not. There are settings in which email is an innovation, because it happens something across them and there are a lot of settings where email doesn't work, so its not innovation as such. That's what we were looking when we were evaluating the projects, not for the innovations as such.*

**Comment by Peter Scott:**
*I don't think email is very innovative, there is no innovation left in email in a sense of changing cultural*

*practices. SMS is an unexploited technology. There is a whole slew of places where SMS is actually not being used. Its very tough for old people to use it, for some reasons that I can't explain. And we are not leveraging the kids in using them effectively. So we were trying to get kids with SMS who are excluded from school. The change is not the technology because the technology is fine. They are very good at it, they SMS each other all the time. The change we have to get is the local authority to accept an assignment from a child by SMS. This means this is like a very few words, but this is from a child excluded from school who has never written a word on a piece of paper ever. But they can do assignments by SMSing them from the workplace placement which is the other place where to put some of these children. The change is with the local authorities to say, yes that counts as an assignment. Those words you sent me count as an assignment. Not only that, the best assignment will pay mobile phone credits to you to incentive you to write a few more words*

**Comment by Eleni Malliou**:
*We had some activities in the school with mobile learning, usually with phones in order to introduce them into lessons. At the beginning we were very afraid, and we said: Is it going to be successful, are children going to accept it? But the children were more ready then we were. They enjoyed it a lot and the lessons were successful. After that we begun asking children, what are you doing with your mobile phones? And we were so surprised. We couldn't imagine what they were doing. Of course they send SMS, they live through their mobile phones. Its different. I remember that we used to collect CD's or discs or music but now, they have everything in their mobile phone. They are learning , they are playing, they are communicating, they are doing everything. So if we think that in order to have innovation we need to change, if we think at learning, we have to keep in mind that children are ready to use technology because they are really interested in. And from what I see in the school is that most of the times teachers are not ready, but not students. Students are ready and prepared and they understand. The hard part is to make teachers use them, not students.*

**Question**: *Do they use mobiles?*

**Comment by Eleni Malliou:**
*Everything, computer, mobiles everything. They take music from the computer, put it in the mobile, send it. They cheat when they write examination with their mobile phones. We said to them to tell us the truth and nobody will punish you and we were amazed about the things they are doing in the school. But we have to take advantage of all this things, because if we want to motivate students, then we have to take advantage of the things that motivate them, not to be afraid.*

## Presentation by Peter Scott:

I want to show you some innovation. I'll show you some slides, on **Prolearn**. If you go to www.prolearn.tv you will see Prolearn.

Prolearn is a network of excellence for professional learners learning at work. It's about work space learning. Professionals learning at work are very operational, they are very time poor. In the Knowledge Media Institute we spend a lot of time investing in resources to make a teachers' lives easy. We have major initiatives in things like standards, which are really just about making teachers lives easy, although there is an argument about whether or not they make learners live easy at all. I personally do not buy any of the personalisation discussion, but we have a huge part of that. You don't need to let me to tell you too much about Prolearn as an initiative, because you can always go and see it inside Prolearn.tv.

I'm going to keep the presentation, very short. This is just part of an experimental architecture based around Flash COM. Last year the cool technology was mpeg4, this year it's Flash COM. Next year it's probably going to be RFID. Everybody is willing to do cool researching. So if you want to hear some dude maundering about professional networks of learning excellence… with Prolearn you can tap in:

There are seven virtual work packages, each of them looking at a major research issue and trying to bring together the expertise of professionals. There are seven horizontal work packages, each of them designed to glue together the research work packages. Prolearn cooperative learning is about cooperating working spaces

for professionals where you can come in and get an appropriate device and it's friendly and it works in a web page and so on.

Question by Michael Kuhn:
*Why is there this image of an old Greek temple?*

Peter Scott:
Because it was a nice, simple and obvious image to have for horizontal and vertical things ready together.

Mobile stuff. Actually mobile is the one area, that probably is the most like a lie actually. I still have not yet for the life of me thought of anything sensible to do with the mobile. I can do lots of extremely dumb things with my mobile, with my phone with my PDA. But I have yet to think of anything sensible to do with my mobile. So if someone has got some sensible things to do with the mobile I would like to hear it. And I still remain sceptical. And then this TV thing, it's just really about web casting. Web casting is a special thing, we do a lot of web casty type stuff and it's all about rich media. As I said, last year it was all about mpeg4 and layers of media, so this year is all about making life easy for professionals. Actually what I like to show you, again, rather then do the talk, I think we have to talk about the talk, rather then give the talk. So let me just show you one thing that I think is very innovative, which is one of those deliverables. Again, all of this is public stuff, so let me show you one of our professional learning environments. We have a range of them we are playing with.

This one is called Hexagon. As a piece of innovative technology it doesn't make a lot of sense without a camera and a microphone, because it is all about sharing things and about cooperative learning. So you come into a space to learn cooperatively.

This instantiation isn't actually the learning one, this is the office based one. There is a office based one which is actually also about peripheral awareness. Peripheral awareness is if you are working with your colleagues at the distance. As you can see, there are two incarnations of me. In fact that's my desk, my desktop has gone to sleep. My office is coming. It takes a while. That's what my office looks like and normally I'm sitting there. David is an administrator working in the office. You can see someone coming through the front door. That's Enrico coming through the front door. You can't see John working on his desktop, but Peter does and so obviously I will have a conversation with him. It's like a mix between an IM environment and a video always on environment, but you can turn your microphones on as well and share. An interesting thing I wanted to see about this was whether there are any European colleagues in here and there are not. This morning we missed it, because this morning we had a lot of European colleagues who actually were holding a work package meeting in here. Now it is finished because we are a little late. I said, please hang about for a little while longer in your work package meeting, so we can hear what you are doing. Cause this is quite sweet for distributed meetings of that sort.

The technology is all web based and quick and easy to use. So you can see Peter replying there. I can see his hand on the mouse and John as well. Let's ask John if he is coming for a coffee. I hope it will work. But I assure you it does work, if I can figure out how to turn these speakers on. I asked John if we go for a coffee and he will probably say fine. We were playing with the idea of an audio space environment. Everyone has his microphone open in the audio space. If I turn on my microphone I can talk to him. This is me and you see there is no camera and if I don't want to hear what he is saying, then I can go and hide in the corner. And if he wants to talk to me he has to come and follow me. So, the closer you are the louder your microphone gets. It's very obvious. Again, there is a long history of environments of this sort that people have used experimentally. Well, Flash COM, is a nice technology. It works. It works in the classroom as well. We opened this sort of technology to many schools and we are running some Flash COM service for the whole broadband region of the east of England. One of the crucial issues is management. How do you get schools to manage all these technologies when they don't really have any idea how to make a service for this product?

These two guys are talking to each other, because they have the microphone open and they can hear each other but I can't hear them. In order to hear them I have to go and approach them. I have to get closer and then it should be louder, but I don't know which plug to press.

Ok, so obviously in this environment I can't move them, I can only move myself. And obviously you can have a person to person meeting or a large party meeting as well if you want to. And you can draw maps, if I want to make a map with people. There are not many people in there at the moment and as I said, most of my European colleagues have gone.

This is a bunch of people who are in Italy, a bunch of people who are in Spain. The red thing means that we are having a sort of virtual coffee together. And one thing is quite nice in terms of very simple environments as you can zoom to their cameras. Nice intrusive invasive technology. You can actually read some of the things written there, if you are interested.

You can't make these things scale to tens or hundreds of thousand or some that are like our business, but it works in schools.

**Question by Teemu Leinonen:**
*I have a question about scalability. Your system works with Flash and that's not open standard.*

**Question by Peter Scott:**
*Does it matter?*

**Comment by Teemu Leinonen:**
*Its the world wide web consortium recommendations, it is just common that we rely on open standards and that's not Flash.*

**Question by Peter Scott:**
*But how do you use the internet explorer.*

**Comment by Teemu Leinonen:**
*Well we use internet explorer, yes that's right.*

**Comment by Peter Scott:**
*Everything you can use is an open standard.*

**Comment by Teemu Leinonen:**
*But for example it doesn't work on my Mobil phone.*

**Comment by Peter Scott:**
*Yes it does, works on mine. Flash works on my mobile phone.*

**Comment by Teemu Leinonen:**
*Well it doesn't work on mine.*

**Comment by Peter Scott:**
*So does internet explorer*

**Comment by Teemu Leinonen:**
*That's the point, it is web based it is, according to the world wide web consortium diverse of any platform.*

**Comment by Peter Scott:**
*The critical issue is that it has to work, so it works on this, because Flash works on this.*

**Comment by Teemu Leinonen:**
*Just to call it web based isn't right, because it's not according to the world wide web consortium.*

**Comment by Peter Scott:**
*I don't care about that, honestly. I care about things working.*

**Comment by Teemu Leinonen:**
*Flash can't be a future standard.*

**Comment by Peter Scott:**
*We do a lot of open source and they are based on Java and so on, but a lot of that simply doesn't work very well.*

**Comment by Teemu Leinonen:**
*That's true and I agree.*

**Question by Nick Kearney:**
*I'm interested, when I see technologies like these, it all looks wonderful, how do people actually use it?*

**Comment by Peter Scott:**
*To do what, is the question.*

**Question by Nick Kearney:**
*Yes, I mean in your office, can you really use it as part of your working lives or is something to play with. You know what I mean.*

**Comment by Peter Scott:**
*It's a good point. This is all about innovation, actually just innovation. But I can tell you.*
*A: it works, B: it actually isn't that expensive. Macromedia wants to make some money out of this, and that's fine, I have no problem with this. The question is where the price falls. Microsoft is making money as well again I have …more problems with that, but actually if it works, I don't really care. I care about what I can do with it*

**Comment by Mario Barajas:**
*I wonder whether it is an issue that to often it is too good. That first people need to know how to use just IM for useful purposes within the organisation before they are ready for other things. Sometimes its too advanced for some kind of organisation.*
*The innovator, the researcher is just the person who has the wonderful idea, and everybody is turned on by that vision, but to often the problem is that you don't reach like minded souls, and we don't know how to get out of that. There are people who think that this is wonderful, but they are almost scared.*

*Mobiles are new features but why, because they are really useful and they are easy to get used to If you five years ago would have given to everybody a Blackboard or a PDA with a mobile network they wouldn't have known where to start. I think that's an issue, that maybe innovation needs to have all of the human side incorporated. You need to teach people much more than how to press the buttons to make the camera work, but the way is to take and use it.*

**Comment by Peter Scott:**
*There are two useful things. One is to patronise the users, who are actually a lot smarter then you are saying and the other is to say it's their fault that the technology doesn't work. I mean, the reason you have trouble programming videos is that videos are so badly designed and so silly. Because it's badly designed, for no other reason.*

**Comment by Eva Lisa Ahnström:**
*The matter is that you don't know what you need before you just see some examples and then you can start and use it. The SMS and what it is today. It have been some youngsters that started with that, and now I can write them on the keyboard and I can do it much more easily because I'm not so fast with my thumbs. That is the kind of a development that has come from a need. Also the virtual conferences, using Video cameras when you are often communicating with people from different sites. Suddenly you find that it is very helpful if you can see the person. We have a lot of conferences and project meetings, where we use a small video camera and those things. And that speeded up our development process a lot. We don't need to meet face to face all over, but it is easier to talk to people when you can see their expressions. Before that, we had telephone meetings and then someone tried this and it became a need for us.*

**Comment by Nick Kearney:**
*With SMS, the use that was intended was something for quick messages, for really practical messages, they turned it into a conversation technology that invaded us. The real innovation is linguistic. But users don't always invent things in that way. Users very often just use the technology as it is. So it seems to me that you need to be thinking about it, when you introduce an innovation, thinking in learning terms, how the people use this innovation, how can we help them to learn it, how can we make them ready for each next step and the more complex virtual uses of the technology or the approaches that are into this.*

**Comment by Eva Lisa Ahnström:**
*Just one example , but in 5D this children have been working with Power Point and they have done that in a much different way. They experimented with videos with the sound and everything like that and it was a very good way for them for getting into the structure of a computer with handling files. So that was one way for them to learn what they are supposed to know. So you can also use that stuff, not standards, but those very usual tools.*

**Comment by Teemu Leinonen:**
*One more PowerPoint comment. I think, I'm using Power Point myself, just recall my presentation. I don't have anything against Microsoft software, they do great stuff. The problem comes if you ask me to send this slides. I'm not sending you PowerPoint slides, because then I'm asking you to use Microsoft too. That's the point. When it comes to collaboration or when it comes to communication I have to choose, am I asking other people to use Microsoft products, am I marketing the Microsoft product. I will make media files for you, which you can read whatever platform you are using, regardless of the software you have. And I think that's the important point. When you come to the communication when you come to sharing things, de facto standards are not very good.*

**Comment by Christian von Craushaar:**
*But you can open a Power Point presentation without an MS programme, open office for example.*

**Comment by Teemu Leinonen:**
*Yes, you can now. That is true.*

**Comment by Peter Scott:**
*Standards. It's a de facto a standard. No I agree, actually I agree.*

**Comment by Barbara Jones:**
*Thank you very much Peter for your presentation. Andrew will give his presentation now.*

## Presentation about K2 by Andrew Haldane:

I'm using Power Point. I think I should pick up perhaps two three or four slides from this presentation and just try to use them to pick up some of the discussion threads that are going already.

This is project K2, which is an accompanying measure for Fifth Framework technology enhanced learning projects, that have to do with work based learning. Our motto is:" to share is to multiply".

I'm tempted to talk about that for half an hour actually, because I think that's quite relevant to some of the discussions we have had this morning. The little strap line, "to share is to multiply" actually arose from doing a similar exercise in what was really the very last gasp of the Fourth Framework programme. The real last call of the forth framework was an Esprit call, ICT for learning and training in industry. There were 16 projects in there, which were more or less evenly divided between, projects that had to do with tools, free learning and those that had to do with knowledge management. And I think that's where we began to see some overlap and some convergence between what we describe as elearning and what we describe as knowledge management. And they really felt that they should practice what they preach, and they wanted to see some kind of community of practice emerging within those 16 projects and that was easier to do then with the current K2

project. Easier because they all had a common start date and they all ran for more or less the same length of time.

Essentially what we are doing is taking part of what knowledge management is supposed to do. In particularly trying to stimulate the knowledge sharing, and trying to build some sense of a community of practice. Of course a community of practice in its pure essence is something that's entirely voluntary, and so the extent to which different projects engage varies, not according to how good we are in terms of K2, but the extent to which the community does have areas of common interest for them and other projects that they can relate to. I think that when we talk about knowledge sharing, it is to say that's the bit that knowledge management is supposed to do, but very often doesn't. It's the sort of thing where a company spends hundreds of thousands of pounds on a knowledge management system, it's the sort of thing supposed to happen spontaneously, just because the resource is there. I think there are a lot of similarities between some of the kinds of elearning mentioned previously, where just because its there and just because people have gone for the process you have to suppose to assume some learning is taking place. Some scope for collaboration has been in dissemination where we have been able to service an adjunct to the dissemination activities of individual projects.

On the K2 website, we have developed now, but not completed, a virtual exhibition centre where you have the outputs of the projects described in, not marketing speak, but in a way that is organised a bit differently from the kind of standard project datasheet that you might see on Cordis or somewhere like that. We have also organised joint presences at certain exhibitions, at WEM in Lisbon last year and at the Educate at the end of November beginning December, where we took a large booth and put several projects together and created some kind of focal point within the exhibition. So that's what K2 is doing. And I think that some of the things that we are doing here reflect what we are saying about the way web based learning actually occurs. I noticed when people are talking about the diffusion of innovation and the adoption of innovation this morning. I see a lot of parallels between the inhibiting factors in terms of adopting innovation and the inhibiting factors that discourage people from sharing knowledge.

I'm going to indicate some of the trends that we observed with projects that are related to learning just delivered at the workplace. Certainly there is a trend toward situated learning, to try and place learning as close as possible to the context of the work place. And this is in some cases involving simulation and gaming in the field of knowledge management. To build with a specific project a business game for knowledge management. We have some quite specialist simulations, for example related to things like the aircraft maintenance and related to emergency services where you can't actually set a real fire. I mean the occasion to set up some simulation experiences .\ There are a number of projects that are tools for collaborative learning. That set up the kinds of dialogues that we have seen and have spoken about. Within the network of excellence we have been talking about people who are going to learn from each other and not about creating lots of highly structured resources. So as with K2 there will be resources to manage and there will be things available within our website which will then be available in other project websites where people can download them.

To make learning situated and collaborative within a company context, the kinds of resources that you have got to use are in-house resources. So if you are teaching geography you can get from the web all sorts of things about different countries, their economies, their natural resources and so on. If you are in a company, trying to learn how to launch a new product, then the thing is that you want find similar product launches. If somebody has systematically captured lessons learned, from why a particular product launch went well or why it didn't go well and has converted that into a reusable knowledge resource then that is gold dust.

When it comes to take some elearning content from a business school or whatever and you want to put it in your own context you got to mix it with the resources that are available within your own company. And I suppose this is why there is a lot of emphasis on blended or integrated learning where you may have elements of face to face contact. Maybe some face to face contact would stimulate future collaborative learning. We may be integrating content that has been produced by a training provider or whatever, with content that is entirely company specific and internal. There are also tools in projects, that locate customisation and individualisation of learning, breaking content down into small reusable learning objects, which makes the integration of the learning objects that have been created with collaborative learning and with content that's owned by the companies on the company's internet. It let's you put your own mix together. And I think that's certainly very important in industry, particularly when you get down to SMEs. Very small pieces of

information can be related to a specific problem or a specific opportunity. We find that in some of the projects that have worked with SMEs, where they have seen particular busy people, owner managers and so on, who were doing an hour learning here, an hour learning there and you soon will find that the hours tot up. If you offer them 60 hours to manage, they won't want to do it. If you offer them 60 times one hour, well they have just to pick the one hour here and there, then they will do it. So I think that is the trend that we have observed, in the way that we have seen elearning changing. And I think picking up on another point made this morning… about good marketing and so on. I was almost tempted to do my presentation in response to that comment, because I think, in some respects, that if you go out and grab someone from the management school here, they will probably say that the point made was talking about selling rather then marketing and that marketing is supposed to be about meeting needs through exchange processes, which may or not may always be monetary. So I think this is where you can for instance say that the kind of relationships that applies in a community that's using open source for example. And I think that is what we got. We have got powerful sales effort going to things that are an old version of elearning. We talk about things that started in 1985. But this is not really what people want now.

My own personal, sort of first experience with any form of technology enhanced learning was in about 1984 when I was a business school teacher. I went to a training centre of the Rover car company and they where showing all those wonderful systems that they developed and they said: this stands alone, you know, this is all you need. So I asked a question about how the people get help and there is a sort of internal phone number that you could dial if you wanted help, but the real sort of publicity was: If you are a total idiot, this is a wonderful stuff, and it is self- explanatory and just ring the hotline and somebody will help you out. That was the kind of way it was presented, but in fact the workforce subverted that. There was the training event for supervisors going on, on the same place on the same day. And I was talking to one of these guys over a coffee and he was a supervisor for the overhead crane drivers at the manufacturing plant. One of they flagship projects was health and safety things for avoiding crane accidents, so I asked him about this, I said: is it really how they were saying? It stands alone, you need no help and so on. And he said: No. What happens is that, they haven't got learning management systems. It was a book - the learning centre. They go and sign in the book, they go to the pages and look at what should they do and who they know that has been through this before. The system was subversive because you have real peer to peer knowledge sharing of learning taking place.

For me in terms of, will these work based learning projects succeed, I think they will especially if there real collaboration between the various sectors – education, researchers, industry, engineers etc.

## SESSION THREE: Institutional changes introduced by Kathy Kikis Papadakis

Overall, there has been little evidence of institutional frameworks for elearning in the institutions. It seems that it needs a stronger understanding on how to create institutional strategies within the existing educational entities. We can say that the project reflected or indicated that innovation is a culturally driven process with the need for change primarily in people but also in the whole institutional structure. The different changes, that appeared to be needed, as we saw from our review, are two principal ones and the first one has to do with the transfer of control or services, editing resources from professionals to managers and from the business community . That implies for us a need for reconstructing the professional culture, working practises, institutional management styles and conditions of services. It implies therefore staff training. We did not get an adequate amount of data from the projects we reviewed on that. The second change has to do with the provision of educational services, that appeared to be shifting from cognitive approach to socioconstructivistic approaches which requires the design of didactical scenarios and settings, which suggest that there is a need, where teachers and professionals develop, and acquire appropriate skills and competences, to plan such scenarios. That implies training of teaching staff, but again it did not give sufficient evidence, as required. In the overview that Mario presented this morning there was the parameter of resisters and adopters. We found resisting factors that are intrinsic to the educational traditions. If you want classify the different aspects that appeared to be needed for change, its easier to do it in the tertiary level, then in primary or secondary education level, in the sense that universities now days appear to be working closer together and share infrastructure and knowledge. There are contractual arrangements being made between institutions of higher learning and commercial and other entities. All that reduces the costs, because there is more resource sharing,

standardisation, networking and perhaps increased productivity. And issues that have to do with institutional and organisational aspects, we also brought up in the discussion we had this morning and as well as this afternoon. This has to do with the issues of marketing, the promotion of products, process of services and I will give the word to our invited speakers. The first will present the view, the change in an institution of higher learning and its Mr. Wim van Petegem from the university of Leuven and then Miss Malliou will tell us about institutional changes in her school.

# Presentation about Netcampus by Wim van Petegem

I'm representing both, my institutions and I will go back to that part later in my talk, but the fist thing I want to present here is a project we have done with Europace and Europace is a network of about 40 European universities working together on the introduction of ICT in higher education. We exist for about 10 years now, some of the people around the table know Europace from the old ages, when it was working with companies and trying to deliver elearning courses through satellite and other broadcasting technology to companies for live long learning. But now we switched to more internet and web based and elearning how we understand it now at days and we are more focusing on higher education and not so much on companies.

The project I would like to comment a little bit on here is the Netcampus project. Netcampus is a Socrates Minerva project, that ran for two years from 2000 to 2003. It has been finished a year and a half ago and Europace was the coordinator.

and the hypothesis that we started to outline with the Netcampus project while improving open and distance learning in the network, was that if we see the benefits of elearning, how come that it doesn't happen so often in higher education institutions. And is there a solution if we network universities and let them work together, or collaborate.

So the objectives of the project were to promote the understanding of the qualities and characteristics of open and distance learning. Especially with the component of networked elearning, to clearly demonstrate the potential of the networking component and to remove the barriers that could obstruct individuals to go ahead with elearning in their main stream education.

Just a lit of our partners. As you can see we had partners all over Europe. We had a selection of partners in the Europace network. My own university: Universiteit of Leuven

Twente in the Netherlands. Aalborg in Denmark, Helsinki in Finland and so on. Also a lot of interested parties from central and eastern Europe were involved in this project. Some of these are networks, little networks in them selves.

The work programme. Well it's a very classical work programme, as already has been said we have done assessments of elearning and the consolidation of existing knowledge. In that face we also tried to identify the benefits of elearning and networked elearning and the barriers for networking. Then in work packager two we tried to define potential solutions for the barriers and potential scenarios in which you can enforce the potential of working together in elearning. In work package three we tried to implement these scenarios in different institutions of the partnership in the project, to validate the models through pilot activities and there has been a work package about dissemination and actually we can see this workshop here as an extended dissemination. There was also an evaluation phase and a work package on project management.

Let me fist concentrate on the work package one, in which we tried to identify the benefits of elearning and networked elearning and to identify the barriers that could hinder people to go ahead with networked elearning. Maybe I should first add something here.
As you can see the structure of this workshop, people have the tendency to classify the problems into technical problems, organisational problems and here in the workshop we were talking about socio-economic problems. In our case we added a third aspect which was the pedagogical problem. I think this is valid and I think it is very much true that barriers that you can identify for people that need to implement networked elearning can

be classified in this three categories, but I think I would like to go the slide number 12, because you can also have another classification of the problems and actually we were more focusing on this two classifications

There are some practical problems, practical problems in terms of technical infrastructure, in terms of copyrights, language problems, quality control and credit transfer if you are exchanging courses and students between courses and institutions. That are all practical problems. I think this kind of problems are the easiest to solve. How we did it in our institution I will explain later, but the most difficult obstacles for elearning are of totally different nature and they are what we call attitudinal problems. Attitudinal problems are for both, students and teachers and the other staff members of the university. We just name a few of these attitudinal problems here. The overall reluctance to accept changes, innovation, change management at the university are the fear to lose autonomy and decision power in the curriculum development. If you are working together, collaborating with other institutions in real networking activities then it's a little bit difficult because you are not alone as teacher responsible for your students. You have to negotiate with other teachers to evaluate the work by your students and there is some resistance to the changing role of teachers in the overall educational process, because, well, if we are talking about elearning it's most of the time also coupled to do students centred learning, that means that the focus of responsibility in the learning process is switching from the teacher toward the student and not all teachers are happy with that evolution. So this kind of problems, both, the practical and the attitudinal problems can be defined in terms of technological, pedagogical and organisational aspects, but we tend more to use this category of problems to define scenarios and to solve this problems.

That was then in work package two, in which we tried to develop models and methods for people to sensitise teachers, to raise awareness of the benefits of networked elearning and to lower down the barriers for going ahead with elearning.

If you go back to the fact that we have practical and attitudinal kind of problems and that you also can categorise the technical, pedagogical and organisational problems, you can imagine that you have two times three scenarios to develop, so that you should end up with six scenarios and models to handle this problems, to handle this barriers. We decided to stick to three models. Three network models that we wanted to try to evaluate in pilot courses with the partnership in the project.

And I have listed them here, within an existing course you can use online interaction. Another scenario is, once you have a course developed you can through the technology introduce students at the distance make it a distance course or open distance course. Another scenario is more having physical mobility and the residential seminars and students moving from one university to another, but you add and support them with virtual mobility, lets say, with networked elearning tools and methods.

Here is a short list of pilot courses in which all this three scenarios have been tested. I don't want to go into details, because these pilot courses did run already two years ago and in the meantime some of them has already evolved to some other courses, some of them indeed has run in the project and were not sustainable afterwards and I apologise for that, but its honest to say that some of this pilot courses were interesting for the project, but there were no support for continuing them after the project. So I don't want to go into that.
There was also, as a kind of overall model. We decided that it was good to combine the best practices in all this courses or into a training model. We could then offer it to teachers that wanted to go for a networked elearning.

So we developed a specific training module deriving from the pilot courses we have run in the project and in which teachers were trained in networked elearning. This training module has been adapted in another project and is now continuous to be used by Europace as a training offered to institutions members of Europace.

The disseminations. What I want to say here is just that there is a website where you can find more information about this project, all that I haven't said about the pilot courses and about the barriers. There is a whole inventory of barriers characterised in a sense that I pointed out here. You can find reports and also the final report of the project can be found at that website. And as long as Europace exists, this website will exist. There is no problem of not finding it. I'm not sure if everything is in .PDF format. It could be that some of the reports are in Microsoft, Word or something like that. I apologise. But if I remember well, I have seen yesterday that the final report is in .PDF format.

The question here is what about transferability, sustainability and scalability in the Netcampus project. Well, one thing that I would like to mention here is that the Netcampus project is just one project in a series of projects that Europace is running with universities in Europe. The successor of the Netcampus project was the cEVO project in which we were working on a collaborative European virtual university. We said, that if one network like Europace could be used for networked elearning, why are there not more networks involved. So we were talking to other relevant networks that are introducing ICT in higher education, namely EADTU, the Coimbra group, EDEN, ECIU, and maybe I forget a few of them as well. They were all working together with lot of universities that were embarking for a major action on networked elearning. So this project just finished two month ago and we have the website there, the final reports and whatever Is available as an outcome of this project, you can find it on the website.

But this is just one aspect. Is this now transferable to other universities to other networks? Yes I think so. You can find some examples in the cEVU project. Is it sustainable? Well I'm not sure that you can prove that where to see if your project is, because this still is a project and it's founded in a project way, so it not sustainable in the sense that it is been taking up by the individual universities in their main stream education, but I will come back to that in a few minutes. Is it scalable? Yes I think so, as I have seen in the cEVU project we even added more networks, so much more universities working together, so that I think, that has been proven in the cEVU project as well. But now coming back to the question of sustainability. Is it sustainable what we have learned in this kind of projects. I don't have slides about that, because I wasn't prepared to talk about my own university, but I think its interesting for this group here.

My own University decided five years ago that it was time to look at all kinds of initiatives at our university where a lot of early adopters have proven their interest in doing something with elearning in their courses. So there have been a lot of initiatives happening at our university, with a lot of different tools used by all these people, making it very difficult to support that from the university prospective, from the university management prospective and also from the prospective from the students them selves. As I told you during the coffee brake, for students it was very difficult to see that for this particular course they needed to use that kind of tool, they needed to go to the web or they needed to do something with a computer conference. For another course they needed another web application or another tool. And for another course they needed still other tools. And if they go to the following year or following semester, then they needed again to use a lot of different tools and applications. So our university said: well this is not the right way to go. If you aspect us as a university to support you as a teacher with elearning applications and elearning in you education, then we need to, and sorry for the word, then we need to standardise tools and applications in our university. So the technological solution that we found was ok. We have set up blackboard for those who know it, we also have question mark perception for questionnaires and this kind of things and we also have a learning repository tool. In this way and in the right combination we could find a technological solution that we want to implement campus wide. For all students and all teachers at the university. If you as a teacher are not happy with that solution, that's not a problem, you still can use your own tools and own applications, but it then up to you to support that and to explain that to the students. So there is a central decision made for this particular combination of tools and applications, and in this way we try to overcome the technological problem. There is another aspect that I should at, which is that we also wanted the students to have access to the whole system through a technological solution, so that there is no one left behind and so there is a whole system set up of connecting students residencies and the homes of people where students are living to the infrastructure of the university. There is no reason that one student should be left behind with the chosen technological solution. That is one aspect. The Technological barrier has been lowered.

Our university decided that there should be one pedagogical concept for the whole university. Ok, again, many teachers don't want such a top down decision and they don't want to fit in the framework that the university is imposing, but therefore we have chosen a very broad pedagogical framework, it is called "guided independent learning" and in that we can have a lot of learning activities, even the face to face contacts like here. Lectures but also seminars, paperwork, labs and also things that can be done on the web can be included in this pedagogical framework. But that made it clear for everyone at the university, that whatever they were doing with technological solution, it should fit within the larger pedagogical framework. To make it clear for the students, that whatever they are doing as a learning activity fits in one general framework. So that is I thing the way to solve the pedagogical problems.

And then we still have the organisational problems. How do we solve that? As it is a top down solution where the university said "if you are choosing as teacher this solution, then we will support you", the university has decided to make a support team of about seven people at our university that is working only on the digital environment for all students. This means that these people have to solve all technological problems, but also to make the most of the technological solution in terms of pedagogical, didactical use of the tools that have been provided. So there is a mixed background for this team of seven people. There are both, pedagogies and technologists in the team. But with this seven people we try to support 25.000 students in our university and about 1.500 teachers. And it works. It started two years ago and what we have seen is that gradually, each semester, the number of courses that have been introduced within the digital learning environment has doubled each semester. Of course, if this tendency goes on we will be at the limit. I think next semester or something like that. So if you think then is this sustainable, is this scalable. I think yes it is, but you need to provide the right tools, you need to provide that pedagogical concept, you need to provide a support team at the university, so that you can indeed say this questions can be answered with a yes. Just to mention scalability. The team now is evolved in such a way, that we serve even a larger community then the figures I have just mentioned and just to make it clear, in Flanders we have what we now call associations of universities and polytechnics. Due to the Bologna process, higher education has gone to a change process, in a sense that everything is now ordered in bachelor and master degrees. That means that the bachelor degrees that are offered to the polytechnics should nicely and smoothly lead to the possibilities for getting a master degree at the university. So each polytechnic now has been associated with one university in Flanders. My own university has associated with polytechnics from the cost, the west boarder up to the east boarder of Flanders, which means , well its not a big county Belgium, but at least 200 km apart. Now if you want students served in this associations, we can easily try to do the same thing as we have done for our own institution. So we will scale up from 25.000 students, up to 75.000 students. But again, we need a stronger team then. We have seven for the university. They have all the experience, they have the equipment and they have the skills for doing that, but we will gradually introduce more and more polytechnics in the system and we will also enlarge the support team with tree or four people at the end. But the pedagogical concept will also be implemented in the whole association, also because of the bachelor and master policy or strategy in the association and the technological solution will be the same for the whole association. In this way, I think we can answer the questions with Yes.

**Kathy Kikis Papadakis**: *Thank you*

## Presentation by Eleni Malliou:

I want to say something about institutional issues in primary and secondary education. I think that the difference, or the main problem in primary or in secondary education is that schools tend to be very traditional. They are not flexible to changes, there are not flexible to innovation and this is the most common problem that we face. However in the society in which we are living and facing the changes that we face, there are several things that should be taken into consideration. School should be the open institution of the society. The way schools are working today, they are not open to the society, they have a specific curriculum and teachers have to follow this curriculum. Students have to take examinations in order to enter the university etc. But in this way there is no interaction between school and society and this is big problem, because in this way school has no interest for students. I can think at many influences, from internet, television etc. So if school stays such a traditional institution it is not interesting. This is a very important institutional issue that should be taken in consideration for primary and secondary education. The second is technology and the use of technology. Most of the times, as I said before, the students are familiar with technology. They are familiar using the pc and using the internet. However most of the times in school, technology stays within the framework of a specific lesson like computer lesson, and we have this other curricula's, history, maths , science, languages that has to do nothing with technology. And this is mainly because teachers are not ready to use technologies for the proposes of their lessons. So technology plays an important role and students are familiar with these. We have to find a way to make teachers more familiar with technology and of course to make educational technology more attractive for students. Because students play games that they are extremely attractive and then we end up with CD-ROMs or educational material and things that are not attractive at all. It seems that they compare that, because they know that technology can be attractive and what

we present them is not attractive.

The third issue is the European dimension of education. The way Europe is organised, all the discussion we had about project Europe etc. It seems that this idea should get into the school life. Children and student have to understand that they belong not only to a country but to Europe in general, and they have to learn to communicate and collaborate with other students. They have to learn to understand and appreciate other cultures. And this is also something very important. In the school we have performed several education activities, most of them funded by the European Commission in the framework of Minerva or IST projects for language learning, and we experienced big differences.

All this issues can be held and encased in traditional projects, because they give students the possibility to communicate with other students from other European countries, they use technology in a different way, not only in the framework of a specific curriculum. And of course we even have projects that open up school to society. One of this projects, to give you an example, is the AGRO web project. It was a Minerva project and the main aim of this project was to make students talk like businessmen. So we developed a web-space and children had to do a sell with traditional products from their country. They selected the products, they performed a business plan, how should they market products, what culture it presents, what the prices will be etc. and then we had an online shop and children had to buy and sell products. Of course they learned not only to use technology but also money. It was actually the time the euro was entering the European market and so they had to realise this as well. They also got to communicate and collaborate. Just an example and I don't know if I can give you some more, but this are my main concerns and thoughts. Concerning what kinds of institutional changes should be considered in secondary and primary school.

**Comment by Kathy Kikis Papadakis:**
*You are using technology in the sense, I know you are a considered to be a innovative school in Greece. It's a private establishment.*

**Comment by Eleni Malliou:**
*It's a private school.*

**Question by Kathy Kikis Papadakis:**
*An elite school. Internally in your institution, it has the fact that you are using ICT in the learning process. What a variety of the issues as you told us brought for the change?*

**Comment by Eleni Malliou:**
*We have been engaged in innovative educational activities for like five six years now, however this change is very limited. Ok, we managed to get teachers involved and interested in this, but most of them are not ready yet. For example at the end of this school year, five children from the first graded high school, this means 13 years old, came and they said to us: "we don't understand why we should have books with us". I mean we have pc's and we have books and we have to carry the books. Why can we not use the pc's and elaborate our exercises. And we said you need books and you need your textbooks as well. We are trying next year to make a framework of specific lessons not to use text books anymore, to make them use the internet and learn to elaborate resources from the internet. But its not easy for us. So there is a kind of change, but it is not as big as we wanted. We have to change mentality. And from my experience teachers including me, always dream of a teachers from our childhood. We love this picture and we want to be the same teacher as they were in our childhood, but the world is changed and students should not follow our time, they have their own.*

**Question by Eva Lisa Ahnström:**
*Have there been changes in the way they work? Is the work now more interdisciplinary more in teams?*

**Comment by Eleni Malliou:**
*Yes, I mean there is a change especially concerning young teachers. The younger the teacher is the easier adopter, because they are more flexible to change and they want to test new things. There is a change, but a lot of things should be still done.*

**Comment by Eva Lisa Ahnström:**
*Do you have a change in the organisation of the school ?*

**Comment by Eleni Malliou:**
*No, not in the organisation of the school. Only within the framework of several curriculum and several examples, but not the organisation of the whole school.*

**Question by Mary Ulicsak:**
*This project is just in this one school in Greece isn't it?*

**Comment by Eleni Malliou:**
*No, it was not only in one school.*

**Question by Mary Ulicsak:**
*Ok, so does that mean for the scalability issues that you have been working with teachers from different institutions? And in particularly, when you were doing business things, have you actually been around training teachers in other organisations or so?*

**Comment by Eleni Malliou:**
*Well, teachers training is always an important parameter of each project and of the times in the projects a specific time framework is dedicated to that. In this project, schools from Greece, not only us, but also schools from Austria and Portugal participated and the teacher training was in the ITcole framework, for all this teachers.*

**Question by Mary Ulicsak:**
*You said students have mobile phones and the students found the ways of using it. Did they use it for exercises or with a specific content?*

**Comment by Eleni Malliou:**
*Yes, I mean that was another project and we used it for history lesson and the contend was proposed by the teachers in order to use the mobile phones.*
*Once we have divided students into groups. One was performing an educational visit to an archaeological site and the others stayed back at home. While students were visiting the archaeological site they could have information and do exercises through their mobiles, but they could also communicate with the students back in home. This communication and collaboration actually motivated them a lot, because for example students that were back in the classroom and they have read all the educational material, could not see the real thing. So they were asking students that were in the archaeological sites to send pictures to them. But pictures including their classmates, so they could have a better idea of how the archaeological site is, how big the monument is etc. So it was a kind of motivation.*

**Question by Eva Lisa Ahnström:**
*You said that in fact somehow the school opened to society. Can you tell us a little bit more.*

**Comment by Eleni Malliou:**
*Yes, I mean it is disclosed. It seams that students have to study specific curricula, but in curricula the problems from real live do not enter very easily. There are several activities that can help to go to this direction. For example we had a project that we gave students their own journalists. And we have developed a web platform and they have to ask questions to class mates in other European countries. An their questions deal with the current problems, what are your needs, what are your problems in your school, what do you think about your school, what do you want to change. And then they have to analyse the results, perform reports etc. So this activities are giving students a different role from the learner its open window to society.*

**Comment by Teemu Leinonen:**
*I think you are right, but there is big differences between the European countries. In Netherlands almost anybody can start their own school. They don't have a curriculum for all.*

**Comment by Eleni Malliou:**
*I know, this is great*

**Comment by Teemu Leinonen:**
*Even if it is a private school or a public school, they must have their own curriculum which they make public. So anybody can review that. It is a more transparent way.*

**Comment by Eleni Malliou:**
*And actually we wait for the time this will be at an European level. It would be great that schools can decide the curriculum, or either for the books, because in Greece we can not. How do you say, we have only one book and we have to teach from this book.*

**Comment by Kathy Kikis Papadakis**
*Assessment is a critical factor what take away part of innovation, not in Greece, everywhere I think, in the UK as well.*

**Comment by Morten Flate Paulsen:**
*You said something about the school that has been opened to the society and there I just want to share some experiences as a parent of three children in Norwegian schools. My oldest son is seventeen, he started secondary school last fall, and the first day he came home he had no texts with him, but he had a passport to the learning management system. And I, as a parent can log in to the system and keep track on what the class is studying and the times and everything. And I like to do that, because I'm into management systems. But it could take quite a long time for and some parents don't really want to do that. I have better insight in what they are doing since I log into the system. Then I have a daughter in seventh grade and their teacher is very much into sending email. And all the parents of the class have email accesses. So I receive at an average one email per day from either the teacher or from one of the parents in that class, but this is set up by the school and organised by the teacher. It's interesting, but it's a lot of work actually discharging all that emails from that class. Then I have a son who is in fifth grade and his teacher is not much into technology so she doesn't really do much about email or learning management systems. But the parents in that class have set up a distribution list so that we can organise meetings and picnics and football, whatever. This is something going on in Norwegian schools. All teachers, all parents, all students from primary schools to universities are now starting to use this technology as a daily tool for communication. And it's changing the educational system in Norway completely.*

**Question by Mario Barajas:**
*Is there any organisational change within the school system as a whole or this a particular case with yours?*

**Comment by Morten Flate Paulsen:**
*One interesting issue in Norwegian public school systems from primary to the university, is that there are two learning management systems that are very diffused, because they have been developing good systems and they are good at marketing. It's not a political decision that those should be implemented, and I think that's very useful, because we can collaborate from primary school through the secondary school to university level. And all of the schools, all the people have something in common through this systems. I think that could be beneficial for the Norwegian society. I know that in Austria there is a political decision saying that they should use one system, I don't know if that's successful. I know that in Finland, in Sweden and Denmark and other countries, there are a lot of this learning management systems in use. We hear from Wim that one institution can use several learning management systems and in fact in Norway there are two very good systems used by most of the public school system.*

**Comment by Andrew Haldane:**
*I'm not really an expert in the school sector, through work, but I'm indirectly. I'm aware that within UK schools there seem to be a number of schools that are making you serve digital interacting whiteboards. So you can use the technology collectively, as a group. And I think some of the evaluation that is coming from that looks quite interesting, because it gives teachers a way of moving gradually into the use of technology, because it's a sort of, it is lowest level if you like, the teacher ability. It mimics writing on a board. The information I have is that the teachers begin to get pressure from people to become more expert, because they very quickly start to complain if the teacher is just using an electronic pen instead of a felt pen. I think its part of the fast movement of technology if they see any use of technology they don't expect after sit and wait for*

*five minutes for the teachers notes go on a board, so they copy them down. They very quickly want worksheets available, they can download , print, work with, whatever. And I think the possibility of using ICT in a group environment has sometimes been underestimated in some of the phases. I think that some of the resources the teacher is using, in terms of games, some media content or things that are originally devised to stand alone, work quite well with the group, because you can invite different individuals to do the interaction. that to be a movement that's certainly gathering space within the UK, and I know that for the government funding that's been available for innovation in ICT, schools and local education authorities have had to bit for. But there has been some improvements within that founding for example of interactive whiteboards, and that's an interesting step forward. I think that, for example, if you are a school student, you can enjoy surfing, but you can also waste a lot of time within particular websites. I think there seems to be a kind of synergy between the using a technology in a group situation and then later using technologies as individuals to work alone.*

**Comment by Atle Lokken**:
*We only have one or two years to handle this challenge and then it will at some part of history be a staff problem basically. So we have to deal with it from an educational part of view, a technical part of view and organisational part of view.*
*Another observation is that we see reports, and this are research reports that actually are a couple of years back in Norway. We have first secondary students which report that they prefer to read text on the screen. And that's interesting. That's actually a major challenge, not to us but to the publishing industry. And I see tendencies in Norway where the publishing companies are really scared this days, because they see what's happening in universities for instance. There is a huge challenge to their business. So this is changing also the way of doing businesses in the society actually. Because we are producing so much content, we are producing it faster and electronically and distributing it electronically. There is nothing between us, it goes just from the teachers out to the students and the whole business model of books and stuff like that is about disappearing.*

**Question by Mario Barajas:**
*You mean that people still like it more then text. On what media?*

**Comment by Atle Lokken**:
*Well, in this specific report there was the question where you prefer to read text on a book, on a paper or on the screen and we saw a first group of students that actually reported back they prefer to read text on the screen.*

**Question by Mario Barajas:**
*Have they been asked to do a text based lesson on the screen, what will they prefer? I mean it's a kind of tricky question to ask to the students, anyway.*

**Comment by Atle Lokken**:
*Well it wasn't text specifically, a way of text. We have to take into consideration that this students are very experienced. And how our courses are presented to the students will also be also a major consideration in the future. This is a challenge, because we can't aspect the teacher actually dealing with how students aspect the stuff to look like. So it takes resources also from the presentation point of view, which is an experience issue. This is also into power point discussion, because they want accept stuff like that, basically.*

**Comment by Teemu Leinonen:**
*I think it's good to remember that with texts on the computer it is totally different. It's a sort of new process, automatically, because actually you can search, you can copy , paste all that things. You can data mining with that.*

**Comment by Nick Kearney:**
*I was interested about what Morten was saying about the unplanned. I think one of the real challenges is that you can sit down and say we are going to introduce this innovation without planning the way it will change your institution. And then everybody uses it. Until you decide that the real change is not changing for a particular innovation, but changing the institutional structure so that is capable to assimilating the*

*innovation without being distorted When we talk about institutional obstacles to innovation, there is usually this consideration, how do I fit that into the curriculum. How do I fit back with the assessment, because the model of institution that we have in our schools and universities doesn't fit to it. And so your innovation is adopted in unpredictable ways. And often you need to manage the change that has been created. But it's not the question of a particular innovation and a particular change of the institution it's a question of the institution being capable of change and to the amount. We certainly have that problem every time you do something new. Sometimes you have to sit down and think quite hard about how to adapt that and that's because we are quite flexible, but we are not flexible as we should.*

**Question by Mario Barajas:**
*This is about Wim's presentation,. It is very interesting for the universities that are thinking to the move to virtual campuses because many are traditional institutions. Also the fact of presenting an example of a top down approach to innovation. I found interesting also some of the decisions that you made.. I mean we have seen the positive aspects but also some other critical aspects that need to be discussed and considered. For instance you have only one pedagogical model, but apparently you can integrate most of what the teachers or regular teachers do. You have also decided on implementing learning management systems or parts of different LMS? What's the reason for it? Is it because of the economic resources or because you have analysed systems and you have taken the most interesting for your pedagogical model? You could say: We have done that, why not others?*

*But this is not so simple. This way might be easy to move those virtuality in conventional universities. There are not problems but constraints. Maybe one of the constraints is that to implement this top down approach means that you are creating a kind of homogenisation of the whole learning approach. And I'm thinking of teachers and of the students roles. So there is the need for standardisation, I think. Would you also suggest that in order for implementing in practice something like standards. What I see is that the total approaches are the one that really needs the standardisation. Whereas other approaches don't need it necessarily. At the same time I would like to know what can be the constraints within the real problems in terms of moving towards the system. You said people are moving slowly to the system. The system is growing, but I would like to know more about what can be the key problems that you have find in implementing this approach in institutions.*

**Comment by Wim van Petegem:**
*The reasons for the technological solution, was indeed a more economical reason. We didn't want to depend on just one tender for our LMS, Blackboard in that case. Because if teachers are developing material for Blackboards and if, after an evaluation of two or three years, we decide that maybe Webcd is a better solution or an open source platform could be a better solution we are not tied. And we don't want our teachers to redo all the work they have done with Blackboard. So from the beginning we said that we should have a very general learning objects repository. The reason was simple. Our university was also involved in another project, so we had both the expertise and the developers in our university and this particularly repository is also involved in the project. So we were pretty sure that if we put all the learning material in the system, whenever we need to transfer the learning material to another LMS we have that repository and we can transfer it.*

*The reason why we introduced the question mark perception is simply that we were not happy with the ways of questionnaires, or putting together questionnaires. Blackboard was not sufficient for the way we wanted to use it for our university. So we added question mark perception through that particular point to the LMS. So that's technological. There was a whole selection process of about six month, talking to the university management, teachers, students whoever wanted to use it.*

*About the top down approach, just to make it clear, this is a top down approach that our university wanted to install and also wanted to support for the teachers. So just to make it clear, each teacher can still use their own tools or their own applications or whatever they want, but they don't get central support from the university. This top down approach was forced on the teachers because of the students. The students wanted only one system, one digital learning environment to work in. They don't want to have for different courses, different learning activities, different tools. That is not what they want. They want just one framework, one global digital learning environment to work in. If the university has decided to impose that on our teachers,*

*then it should be very clear that we need to convince the teachers to use that solution. And therefore we embedded the whole system and all other kinds of processes of the university. Our digital learning environment is linked to the administrative system, so that teachers don't have to put in their own course. That is already in the database at the university and it is put in the digital learning environment by the team of seven people. So the workload on the teachers for getting all the material in the digital learning environment should be as low as possible. And that is supported by the university. So it is a top down approach, but with a lot of support for the teachers so that they are convinced to use this learning environment. There is also a training provided for teachers, and now we have the central support of a team of seven. In each faculty of the university we have now a linkage between the staff and that team of seven people, the central support etc. So I think this is the only way to make a top down decision successful. And therefore our university invested a lot, I mean, supporting seven people or financing seven people.*

**Question by Mario Barajas:**
*Can you tell me something about the profile of those teachers, who don't join the system?*

**Comment by Wim van Petegem:**
*There are teachers that say that the technological solution is not working for them. An example is a language teacher. She was used to a computer conferencing systems, some of you know "First Class", in which you have the possibilities of audio visual material linking to the way you are communicating with others. And this is not provided in Blackboard. So this teacher still wants to use that solution. Another example at the moment, because the learning digital environment is embedded in the university system, is that if you want to experiment in an international environment with other institutions, unfortunately so far it is closed, and those students can't join in your course. And for instance there are a few, lets say again early adopters that want to open up digital learning environment for international collaboration, they are forcing us toward other solutions then the one we have presented here. So therefore we need some solutions, maybe open source.*

**Question by Teemu Leinonen:**
*I think you kind of gave answer already, but I was thinking about how do you support this kind of different systems. First Class for example.*

**Comment by Wim van Petegem:**
*They can still keep on using these tools and they do it actually, but then they need to finance themselves and to support themselves and for instance one of this teachers hired someone just to support First Class.*

**Question by Teemu Leinonen:**
*But could it also happen that there is a critical mass for you to start to support it.*

**Comment by Wim van Petegem:**
*Actually my centre is supporting First Class for them due to conferences for international collaborations for instance. And that is still possible. Its not that it is forbidden at the university, but teachers should find the way to make it feasible.*

**Question by Mario Barajas:**
*Is the system substituting the face to face.*

**Comment by Wim van Petegem:**
*No, its additional to face to face education. I think for many years to come we will still have traditional lectures in our institution, but the elearning and the digital learning environment are supportive to what is happening in the lecture. Gradually we will move from traditional lecturers to more tutoring sessions, as long as the learning material which is provided to the digital learning environment is not only text, but hypertexts with audio visual elements, with interactive multimedia tools and simulation. Whatever you imagine. The rich learning environment, as long as that doesn't exist we still have face to face tradition.*

**Question by Eva Lisa Ahnström:**
*How do you support the new ways of teaching? I guess you are not just sitting there waiting for it to happen.*

**Comment by Wim van Petegem:**

*The real innovative things, not the ones that you can fit in the digital learning environment, but the new things, the new ways of teaching are supported in a kind of competition. Each year we have a firm at the university. Especially meant for innovative approaches, and so each teacher can apply for a share of that. We support about ten new projects each year and each project can have about 100.000 Euros for two years.*

**Question**
*Is that technical support?*

**Comment by Wim van Petegem:**
*No, it's someone you can hire, for example a person who support you doing innovative things in your education. If you think that the emphasis should be on technology then you can hire a technologist, if you think that innovation rises more into pedagogical or didactical reference, you can hire somebody else.*

**Question**
*When you say in a couple of years you won't have lectures, how do you mean that?*

**Comment by Wim van Petegem:**
*Gradually they will diminish, I think. I still believe that therefore we have a very broad and general pedagogical framework. I still believe that lectures have their role. If you now have semester course with 13 or 15 lectures, lets say, I can imagine that within two years from now we will have half of the lectures and the other half of the time we spend on other things, for instance on computing sessions or just guided independent learning. Students can work with the digital learning material that they find in the digital learning environment. And they can ask questions to the teachers.*

**Question**
*Is that for cost cutting purposes? Or because there is interesting value?*

**Comment by Wim van Petegem:**
*I think it's simply because our students are asking for it.*

*They are so used to playing games or using technology or to having all kinds of digital gadgets that they find it very strange that this is not continued in education when they go through university. We should have the tools there, and it's also the competition between universities, you know. In Flanders at all we have six universities, two major universities and four smaller ones and just to attract the students we need to be modern.*

**Comment by Barbara Jones:**
*Distributed networks, open learning which foster autonomous learning all require big support systems. We haven't touched on the organisational implications here particularly in the context of the hierarchical structures in all education sectors. Organisational hierarchies exist because there is need for organisations to control the processes operating within them. The classroom, for example, is a very powerful concept in the European tradition, that somehow things have to be contained in the classroom, that somehow teachers have to find out what it is the kids are doing. The pupils might show you some of it but there still will be things you never know about anyway. This is a process. An enormous system is created once you give autonomy. The resources required to maintain and monitor the systems are initially great. and organisations for a whole range of reasons want to control those systems. What I am saying is that it is ok to talk about organisational change required by ICT advances but we are entering a very complex area of control in organisations, in society. Who controls what?*

**Comment by Nick Kearney:**
*That goes back to the early conversation about the use of email. It's not the email, it's the misuse of email.*

**Question by Barbara Jones:**
*But who is making this decisions about for example, misuse of email and not misuse of emails? Or any other technologies for that matter?*

**Comment by Nick Kearney:**

I*t's a question of if you are finding the conversations with your students on email, playing the activities you are setting up with your students.*

**Comment by Barbara Jones:**
*Impossible in workshops with hundreds of students working.*

**Comment by Nick Kearney:**
*It would end up asking this question: Hundreds, why?*

**Comment by Barbara Jones:**
*Hundreds, because large open learning workshops are available*

**Comment by Nick Kearney:**
*Maybe you need to limit the numbers.*

**Comment by Barbara Jones:**
*Maybe, but organisations still want to have some way of monitoring users use of resources.*

**Comment by Eva Lisa Ahnström:**
*Yes, some restrictions I think. As well as in all other activities you have restrictions.*

**Comment by Nick Kearney:**
*You need the implementations to that, if you have hundreds you probably will not be able to monitor effectively.*

**Comment by Barbara Jones:**
*But you have to monitor in public libraries. Here you can drop into public libraries, we know children access the internet, so we have our firewalls try to prevent inappropriate material, inappropriate process being made on the interne There are a whole range of issues here. which are quite complicated.*

**Comment by Nick Kearney:**
*Yes, but it's like having a security guard at the door. There are logistical considerations. All my education innovation goes on within that framework, that the question is how you implement within that framework and what kind of flexibility you build in. They have to say: are we willing to allow people to be autonomous.*

**Comment by Barbara Jones:**
*Yes, we want people to be autonomous, but for many reasons , we have to have a huge infrastructure of support, which needs funding. I am interested in who makes the decisions about what kind of control, what kind of infrastructure - the user, the learner, the manager, the politicians etc. It's another discussion for another day?*

**Comment by Nick Kearney:**
*Our policy in our institution is that you cannot stop that at the end, because students are ahead of us. And so the only way to stop it is to negotiate with the students and we are finding this very successful. When we have a problem we talk about it and we solved it that way rather to build this wall around the world. And at the end, if you give them autonomy, that includes security issues, and you still have a problem, then you deal with it.*

# FINAL SESSION: CONCLUSION

## Summation and conclusion part by Morten Flate Paulsen

I will try to summarise by splitting this section up into three. One for sustainability, one for scalability and one for transferability. I would like to start trying to sum up what I've heard today and comment on some of the decisions, maybe add some and maybe have a short discussion on each of this issues. We will probably have 15 minutes or so on each of the features. I would like to start with transferability and to ask what makes online education transferable. I heard several issues here today, we have discussed the standards de facto standards and other standards. When I came here I thought at most of elearning standards such as IMS or AICC and so on, but I learned from the discussion today that you probably would like to include other standards like flash and such things, which are important. I think I learned from this discussion that we could have a broader knowledge and thought about what standards actually are and what we might have had in the Delphi project. I've also heard both, from the ITcole and 5D project, that you have been promoting open source software and solutions and I think that's an interesting way of transferability. Open source could help us speed transferability.

I've also heard about promoting dissemination, portals, and all those issues that are important to share experiences we have from the different projects and initiatives. Those are the three issues that are most prevalent in the discussion today as I understand transferability.

I have also thought that we would touch on issues such as the ongoing harmonisation process in education in Europe. I think that common credit systems, common degree systems, common grade systems will help us make education and also online education more transferable, at least across the national borders.

Thinking about the idea that having common learning management systems might help us be more transferable because the institutions using the same systems will probably find it easier to collaborate and exchange contents and meet other institutions using different learning management systems.

I finished more than a year ago another European project called "Web-edu" in which we interviewed, some 113 institutions in 17 European countries, about their experience with learning management systems. And in those institutions there were, as far as I can recall, 53 different commercial learning management systems used and in addition to that there were 35 internal development systems. And of course in Europe we have a huge number of these learning management systems and I think that they will obviously not all survive . We will have fewer systems and I believe that when the number of systems decreases it will probably be easier to collaborate within institutions using the same systems.

I think those are some of the issues I have gathered from the discussion today and some additional comments from my own thoughts. So I would like you to now come up with some help to the Delphi project, what more should we actually focus on when we work further on, on the issue on transferability. This is a question for you.

**Comment by Nick Kearney:**
*I think it depends on what is transferred. For example, when you talk about learning management systems, that seems to me to be talking about "we get into the learning object for usability etc." Very often, what really you need to transfer are not the particular learning objects but the processes that that learning objects are used in and that doesn't necessarily involve similar technologies, but rather similar human processes and support for the human factor. That is perhaps the key to transferability and it's a problem in general, in a lot of contexts it is hard to transfer intangible things, because they aren't identified as texture to transfer. Because transfer needs an object, a product or some kind.*

**Comment by Atle Lokken**:
*It's knowledge, but it's a knowledge process and that very often are things that aren't defined, they aren't categorised or codified in the right way you should do, and that may be needs to be looked at.*

**Comment by Morten Flate Paulsen:**
*I agree with you, but is that what we are trying to do with disseminations, with workshops and so on. Do you see other ways to deal with this?*

**Comment by Nick Kearney:**
*You have a sort of to strip it down to the basics of it and then reapply it in your context, and that's what's missing. You have to do it yourself right now. There is no organisation, no expert who can do that process for you. And I think that very often means that you simply don't have the resources to do what we say that's interesting and maybe that's sparks something of for me.*

**Comment by Eva Lisa Ahnström:**
*But if you have the support.*

**Comment by Peter Scott:**
*Yes, if you have the support that's an interesting answer.*

**Comment by Eva Lisa Ahnström:**
*And I think that two projects have the support.*

**Comment by Mario Barajas:**
*They provide that support, but I think that's external support and very often that's the difficulty. There is not the internal structure in many organisations That seems to be a key area in the transfer process.*

**Comment by Atle Lokken**:
*It is also about content of the objects, and that's the digital right issue I've seen in many occasions. I see it also in my own university that its really hard to use some content from one course in another course if it is another teacher teaching the other course. I see this problem is increasing. We don't even manage that entirely in Norway and we don't have a good answer. I just see it the other way around, there is a larger effort trying to protect the content then actually to sharing the content. So this is a huge issue we have to deal with and it doesn't have anything to do with technology at all, it's just some kind of human process to accepting that. I had actually a huge discussion in my institution about who is actually holding the content. Is it the teacher or is it the institution, because they are used to editing books and publishing it through a publisher and getting paid for the book through the publisher, while the management is saying: no, if the e-content is made on the institutions time then it's the institutions content. This won't be acceptable to all the staff. So that's a huge organisational problem. My guess that we all have to involve the unions to solve this problem. . And there is also another issue and that's quality, because we in Norway say that this content is equal to this and this credit points and if we send it to other institutions, they wont accept that this content is the same element. The quality is also an issue when we start transferring content back and forward.*

**Comment by Peter Scott:**
*The content argument is interesting. We have huge, huge archives of fabulous content, there is no legal issue with anything we produce because all of the academics sign off for the copyright and everything they do, they do it for the university, because that's what they do. We don't lecture, there is nothing like that. We do a certain thing like study leaves, besides writing books. Basically what we do is to write books and we produce media in terms of media content. In our knowledge media department none of our stuff is written by an individual, it's all written by teams. That's a very complicated business. And what we care about, is our processes. We don't really care about content very much, because it is ripped of a lot. A number of times I have been into a hospital to see the nursery course which is a direct copy of what we do on our nursery courses. But we don't actually really care, because by the end of the day we are never going to sue anybody. The public relations would be too bad, so we don't really care about the content. What we protect, consider our crown jewels, is the way we are going to produce things. And in that, it's hard to have a point of contact with conventional universities. What we need are partnerships, more effective partnerships, to share what we consider to be that thing we protect so much. But actually how does partnership work is the real challenge,*

*because what we do is so very different from what conventional universities do, that it's hard to see where we can even have a conversation. We don't do things on webcd. There is no point of contact, because it doesn't do any of the things we need the system to do. We look at someone like "MIT open course ware" initiative and we just have to laugh at that. It's just funny that they think that's interesting. However it's great PR story, it's lovely content, isn't that sweet ? There are all these nice lectures on bottom line, but it doesn't really interest the open university because we don't believe there is a point of contact. We could be wrong of course, it's possible that we are completely wrong and MIT is right, cause maybe the press release is more important. But we just stand back an laugh at that. One of the biggest problems for us in the transferability thing is that transferability needs partnership of equals and we don't have that. We don't really look at commercial universities and see what we can do with you guys and you. I don't know what you look at the open universities and see what we do, cause we try to hide most of the stuff that we do. But not the content, we don't actually care about the content.*

**Question by Barbara Jones:**
*So what about collaborating with other open universities in Europe, in Singapore and elsewhere?*

**Comment by Peter Scott:**
*There is a big amount of open universities, but we are very bad at partnerships. What we do with these is to flog them courses, we try to keep him his clients, and that's not partnership. Because what they then do is figure out what is it we have done and they just snip the problem of the goal. Its typically how this relationships get to work. It's terribly bad.*

**Morten Flate Paulsen on sustainability:**
I would just say that we all know that we are encountering a lot of obstacles and barriers when we try to transfer, and deal with transferability. Competition is one issue, not invented here, it's obviously something we have all heard I guess, and we also have in Scandinavia. I've been in projects trying to define and discuss the Scandinavian model of pedagogy and see if that's different. And they are different. I think I would like to stop this discussion on transferability and thank you all for the inputs and then move on to sustainability.

In my opinion sustainability is characterised by it's ability to persist when extraordinary internal or external funding stops. Unfortunately it seems to be a rare phenomenon. There are so many examples of projects stopped after extraordinary funding has been withdrawn. It happens with a lot of European projects but also a lot of internal and national funded projects. In my opinion in most cases, online education is sustainable when it generates an economic surplus or produces costs. So I think that sustainability has something to do with cost effectiveness. Peter Scott said earlier today something about that the Open University were using inexpensive technologies. I think that's interesting regarding sustainability. Eva Lisa discussed how they were trying to get funding for the future, income opportunities, but she was more or less relying on internal funding from her own institution and they were trying to form a partnership in which they could apply for further funding. But I really think that they should also look for some ways to get income for the services they provide to the students. And I think that is a challenge. I found it interesting to hear that Teemu talked about Fle3 and said that it has reached a critical mass and was going to be sustainable. I think this is also an important issue. Well I'm really, really concerned about this sustainability issues and in my book I've written a probably quite controversial article which is titled "Online education obituaries", in which I describe some very well known and visible projects that have proven not to be especially sustainable. And I know that we often come up with other examples and I think that we really need to discuss this in future projects. This is an issue that we should be much more aware. We've touched on this in our discussion today but I think this is some sort of summary from my perspective and again I would like the workshop to give some feedback so that we can use that in the conclusion of our work.

**Comment by Nick Kearney:**
*Relating to what you were saying about "open course ware initiative", I actually, for what you were saying, see you on the same kind of wave length as MIT, because one of their things*

*they said was that MIT content is not an MIT education. That what matters are the processes. And I think there is an interesting sentence in the document you circulated before this session, where it said something about there isn't yet an effective model of micro payment. I think that might be a dead end. Because that really is talking about paying for little chunks of content and finding an economic way to manage that. And I*

*don't know where, in terms of an economic model, paying for content, is the right way to go about that. Peter Scott said that MIT seemed to him to be saying that content is an issue. We have a project where we for example do 4 weeks course with 5 pages of content. The content is the people not course.*
*Our problem is that sustainability is about developing an appropriate model and then maybe the models we need to be looking at are not models that have been used in education before. Maybe you are looking at models where education is seen as joining a club or paying for a gym.. It's a sum you pay regularly but you are not paying for a particular item, but to be part of it. I don't know. That's the other issue. When does your innovation need to stop being considered as a separated thing and as part of the general education services that you provide. Especially when we were talking about, in a lot of cases, sort of blended approaches where there is some online stuff and some presented as lectures or so..*
*The issue is how do you set up your cost structure. Do you have it in separate books or do you integrate it. And if you integrate it than it's just another part of your infrastructure. However it seems to me to be very green and needs an effort of thought. I think there is not much thought going on about economic models, especially for the kinds of elearning that have a cd-roms etc.*

**Comment by Barbara Jones:**
*There is a real need for some kind of new economic modelling. The issues are not really being fully discussed and the projects are not given much help on this. There is a great deal of complexity with the positioning of the private sector, and their dominance, particularly from North-America, With some international universities you pay to join the club, to have access.*

**Comment by Eva Lisa Ahnström:**
*The sustainability we discussed is about having partners that should pay every year, or the schools should pay a sum every year to be able to participate and we decided very quickly that the schools can't pay because they have so little budget for extras. Partners that pay can be a possibility but we will not have that to start with within a non profit organisation. Because since the project has recently ended we can relay on the commitment from the partners. I think we need to take up this issue with some kind of payment for the partners and that payment could be the commitment say to work 200 hours a year. That is perhaps easier to get, than to have a specific sum of fresh money to put into the organisation. That is another way of accounting what we have to pay for, because it's mostly work that needs to be done. We also need money for hosting of the web server and technical administrations and stuff like that. To raise money for that we have some time to find some way within this non profit organisation. And the network is very important to stay sustainable.*

**Comment by Morten Flate Paulsen:**
*It's important to raise some money to be sustainable and I would like to use this opportunity to come up with an analysis of the Swedish system which I'm kind of critical towards, because in Sweden the universities are not allowed to charge tuition fees to individuals and students for online education or any other source of education. And I think that, since Swedish universities are so reliant on funding by governmental funds or maybe cooperation, they lack on incentive, what institutions in most of the Europeans countries have, to get this change, to be sustainable, to have this sort of income. I think is interesting to point out that this happens in Sweden and maybe Germany and a few other countries. But there are differences within Europe towards how universities can get income, and I think that's an important issue to address in the future and in a coming competitive global European market.*

**Comment by Peter Mirski:**
*Just a brief addition to the sustainability. What we see in terms of business, when we are screening very successful businesses, the one thing, and this is the approach that we chose, is they try to analyse the business and finding out what the clou product was and then dedicate it and see perhaps the setting was so brilliant that is the reason why this business is very successful. On the other hand there is also a theory which (x) only of the person of the company owner, so this is leader ship discussion. It is perhaps just an addition to what we are looking for. Because sometimes we are wondering, for example, you or your project is extremely successful and we believe it is successful because it had a lot of good ideas. Perhaps it is only successful because Eva Lisa is Eva Lisa, everybody likes to work with her and she has a really good spirit to bring that into people and setting up networks. Just an addition to this discussion.*

**Comment by Mario Barajas:**

*I would like to add that I think sustainability is very much context. Well it works in this example of business and some universities, but if we talk about a compulsory educational system, sustainability problems are very much different then those of this areas. In the case of the educational system I think the sustainability of innovations are very much related to closeness to the curriculum, to the curriculum of schools. I mean, are this projects really so far away from what is the curriculum content and organisation of the schools that want be sustainable. I think it's not a problem. We don't have to worry about the sustainability in this cases. It happens. Innovations can not go against a so traditional educational system as the ones wanted by the state, which are compulsory any way. So maybe if we should form new opportunities of combining curricula and innovation and projects are very good approach that this will have more opportunities to be sustainable.*

**Morten Flate Paulsen about scalability:**
In my personal opinion the most important trend that is going on within elearning and online education within Europe this days is the move from small scales in experiments to the large scale of ordinary use of the technology. There are differences within Europe, but I think this is a really important mega trend. And there are some implications for scalability. How can we do this effectively from small scales to large scales, on a course level, on an institutional level and on a national and an European level. I've heard several interesting comments today, but I would like to start making a comment brought from a Danish colleague who has written an interesting article about the Danish experiences on the history of minor education in elearning. He is comparing collaborative learning, which has been the Danish model from the start, with computer based training or elearning approaches. And he says that the Achilles heel of collaborative learning is that it scales so badly, and that the ability to scale in a controlled and manageable way is a substantial and timely requirement in Danish online learning right now. With this in the mind I was listening to several of you who were addressing collaborative learning and I wonder if collaborative learning is a model which is better suited to small scale projects than to large scale online education. I think that is a challenge that we should at least have some ideas about. Is this change from small scale to large scale coherent with the current focus on the collaborative way? And I would also like to be a little provocative because this scalability has to do with, in my opinion, some sort of mass production, some sort of industrialisation which is not very popular to say in a university with a pedagogical environment. But if we should do this effectively on a large scale we have to find ways to do this cost effectively. It has been ok to use a lot of money per student when we deal with small scale projects as we have been dealing with so far. But when we move on to large scale environments we can't spend the same amount of money per student on the large scale. We can not afford to do that as individuals or as institutions.

So those are some of the issues I am concerned about, in the move from small scale to large scale. And I know they have controversies but those are some of thoughts I have gathered and I would like to have, as I said earlier, some more feedback from the workshop so that we have stuff I can use in our further work with the project.

**Comment by Eva Lisa Ahnström:**
*For me to having collaborative learning in a bigger environment doesn't mean that we should have 2000 people at the same time working collaboratively. It is the process of working that can be scalable, that can be used for more groups. It doesn't mean that it should be so many.*
*I think the flexibility is one important word here and also to have frameworks that can be adapt, because it can't be reused the same material in different courses. When you set up a net based course for example, you have a huge amount of investment. Especially for the first course and than you can see this diagram first big, and than it goes down a little bit, because you can always reuse some of the material or some of the methods. For some courses you can have it into a big scale and you don't need that much support, you need support, but not that much as in the beginning. So the course effectiveness comes. I don't know if I'm naive, but I think if we do that and if you are all flexible enough and don't stick with one application that should be the same all over Europe, it should work.*

**Comment by Teemu Leinonen:**
*I think it's up to quality and especially at what kind of skills you want the people to have. Anyway the content for students is enough, its fine. But I think that Chinese and Indian students are able to read the "MIT open course ware" content already and I'm not sure if we can compete with that. I mean we can compete with something else, then we come to the processes and the difficult mission, so which is more expensive, but the*

*results according to some studies are better.*

**Comment by Peter Scott:**
*I just say from out of what we do, there is no problem with scales. For example we have 80000 students, but they are all in groups in 10 to 15. And we have something like 8 to 10 thousand associated lecturers, but it's a different model. There is not the problem with scaling something like that. Your systems just need to match it and you have that design, the design to scale. Pretty much all of our courses have a collaborative exercise of some sort, but it's just how we deal.*

**Question by Teemu Leinonen:**
*You have some two by two structure then, student two by two as well?*

**Comment by Peter Scott:**
*Administrating bunches of 15 students when you have 8000 on the psychology course or 15000 on computer science course takes a bit of doing, but actually collaboration for the exercises, from the students point of view, there are only 15 other people to work with. They have this exercise they have to do together. Togetherness that brings learning to us and communication which is vital.*

**Comment by Morten Flate Paulsen:**
*But you are saying, the students of yours will say that you as an institution have a quality control system, a training system, a management system. These are challenges to deal with in ordinary institutions that don't have that.*

**Question by Barbara Jones:**
*The OU model is perceived as a very successful model, isn't it? That's the feedback that I get*

**Comment by Peter Scott:**
*It's expensive.*

**Question by Barbara Jones:**
*It seems then that the existing models which converge, or existing institutions which converge with the OU model might be successful. ,*

**Comment by Peter Scott:**
*They can take our course right now. They can go to the web page, type in their credit card and they can take the course. It will just happen. It's kind of already done. And that's the particularity. You don't want do that. Just to come back to scale. Scale is not a principal issue for collaborative learning.*

**Comment by Teemu Leinonen:**
*But it's been expensive like you say.*

**Comment by Eva Lisa Ahnström:**
*But if you look at collaborative learning in primary and secondary school then it's not more expensive to teach in that way, to learn in that way, not to learn in the ordinary transmission – formal learning situation.*

**Comment by Atle Lokken**:
*Its risky collaborative learning in the first years. Collaborative learning takes a lot of manpower to handle. And we have to recognise that in the first years there are a lot of skills that we actually need and a really good example is mathematics The basic mathematics all engineer students have to go through. This is the subject most students pay for. The new business model, at least in Norway, is that we get paid by the government per student that take their exams in our university. So it isn't a good business for us to keep the students on our campus. We want them through the system, as fast as possible. So it's a bad business model to pay the student. We need an effort that actually makes sure that the students go through this courses. And we see that we can have a lot of elearning content and we see that we can have a lot of smart content, actually dealing with the students problem right there in that without going the way through a junior report with collaborative processes. They can do skill training basically on a computer. And that's the technology thing.*

**Comment by Nick Kearney:**
*I don't think the current face to face lecturing model works very well. You are not comparing like with like when you compare the richness of many collaborative approaches with the costs of a lecturing system. That's the first point. I also think that there is an aspect, that perhaps we need to be patient, in the sense that they have invested in it for a very long time and developed the know-how to do all this. When something is new it costs more to introduce it. It costs more to get the students used to it and it's a question yet of spending some money on developing the systems especially, I think for the support systems and on maturing the learner. And related to the cost in collaborative set ups is that, if the student were just a little more independent you wouldn't have to be doing it. And you can probably find economies by teaching them how to do it at the start rather then setting up a expert to support a system and to deal with it when it appears. You anticipate it at the start of a course. You have an induction process. Things like that could be wise or making it more economical to do. I think there is a point that collaboration costs more, but it can be higher quality. And that's something, that's a decision everyone has to take.*

**Comment by Andrew Haldane:**
*I think I see some similarities between the discussions that we are just having and discussions 20 years ago, when we were looking at how could you introduce more flexibility to further education in the UK. And I think some of the points coming out from the discussion are that there are pressure points like the example about your first level mathematic of the engineering students, where you can see how there is a current system that takes place. It has processes, it has business models and so the learning outcomes are what got to be archived. And I think, if we use different processes, and different methods to achieve the same learning outcomes and what is sustainable, in the way we work at the moment, it will be the kind of things that you merge. I think that what we are talking about is the evolution. We are talking almost about a*

*kind of internal market within university, within college, within training providers, where you look at what should be our priorities, where is an up front investment now going to produce cost savings.*
*That's where I think we can see that there is enough happening for people to be able to do their own process of evolution and I think, sitting in a management school is were the first two questions that you ask your self in terms of business strategies are one: "Is this a good business for somebody to be in?" When you have done that analysis and if you say yes, you then ask yourself "Is this a good business for us to be in". And I think that for some universities it's a good business to be in . I think it's looking for the niches, looking for the particular pressure points. You have to do a sort of cost benefit analysis much on a micro scale within components of courses, specific courses, what specific client you use etc. So if a European university does have a particular relationship with an emergent African country, China or whatever, then that changes that particular pressures of priority in the school. I think it's not kind of responsiveness, more a sort of micro level rather then saying that we come up with some sort of model for higher education around Europe. This is a blue print. I don't think there is one single blue print and I think its just this process of evolution, prioritising, working with niches, working with particular market segments and a gradually changing process. It's the issue of a changing perception of staff and so on. It is where they will see a reason for change, a reason for doing things differently, a logic for it. It's going to be a case by case bases. I think that's where in terms of collaboration, I think it's important to look at the little case, like your maths engineering students. It's about finding out who are the other people who have tried this, who are the other people who have done alternative approaches. What went well for them, what would they do differently the next time. I'm trying again to match those partnerships, and I think that's where the programmes have benefited. In horse racing they say "Horses for courses".*

## Conclusions by Mario Barajas:

I think the workshop has achieved the goal of gathering together a set of people for a rich discussion and for an exchange of ideas. Some times contradictory, some times in agreement, but always interesting. I think we have found very many interesting aspects with respect to the discussion of the key dimensions of this project. Pedagogical, institutional and socio cultural factors and I think the last session gave us much more insides. It has also achieved the goal of creating a discussion that we would like to keep alive. We would like to contact you later on, after this workshop, in order to introduce you to some of the ideas we will keep working on in

this project, as the laboratory and the observatory. We will publish the proceedings of this workshop, which means that we encourage you to send in a written form your presentations as soon as possible, and in the medium term we would like to publish an edited book. The proceedings will be the first outcome of this workshop but we would also like contributions which could be published in the book. So in the near future please send us contributions. You can send them to me.
We have had with us a representative of the Commission. I think the workshop sends the Commission some interesting outcomes and results and we still have some time to make some questions to Germán.

**Comment by Kathy Kikis Papadakis:**
*For sustainability of our hard work we need funding ! Think about it.*

## Comment by Germán Bernal: European Commission

I just like to thank you for giving me the opportunity to attend this workshop. It was very interesting to listen to all your contributions. My main objective was to get to know more about the Delphi project itself, because I'm the project officer of the Commission. But it was also interesting following the discussions. I'm interested for future policy making of course, but policy making on an European level and you can imagine, it's a very long process with many other jobs involved, not just the officials working there.
It's a long process. We got a new educational product after 2007, I now don't remember the states of working of the commission reflecting on what will these new products be like and whether ICT education will have some specific programme for itself or if there will be some objectives within a broader life long learning programme.

**Mario Barajas:**
*So thank you all very much for your assistance…*

**Time: 17.58**
**Location: UMIST , Manchester UK.**
Transcription by: Christian von Craushaar