UNESCO INSTITUTE
FOR INFORMATION TECHNOLOGIES IN EDUCATION (IITE)

High Level Seminar for Decision-Makers and Policy-Makers
from South Eastern Europe

Towards Policies for Integrating ICTs into Education

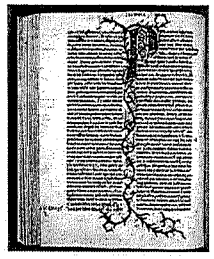
16-20 February 2004, Bucharest, Romania

SESSION 2

Technological Trends

(Mega trends and Responses)

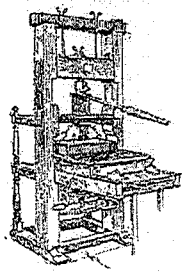
Presenter: Mike Aston



The Gutenberg Bible - circa 1450

16th/18th Century
The Agricultural Revolution

- crop rotation and fertilisation
- selective breeding (sheep and cattle)
- animal-drawn farming machines .....



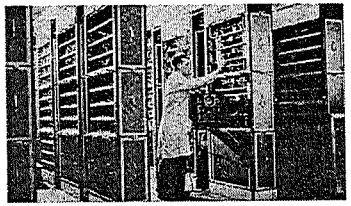
An early printing press - circa 1500

Early 18th Century
The Industrial Revolution

examples:
- weaving
- waterpower
- factories
- coal and iron
- steam - engines - transport

The Industrial Revolution continues

- internal-combustion engine, transport
- manufacturing
- mass production
- electricity
- cars, aeroplanes, telephones
- growth of cities
- rich v poor accentuated

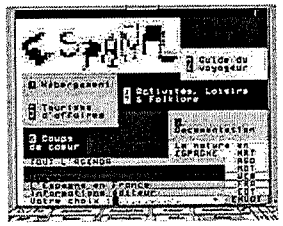


Lyons Electronic Office (LEO), London, circa 1952

The Technological (post-industrial) Revolution

- atomic power
- digital computing
- satellites
- technocrats, planners and scientists dominate
- extension of technical rationality
- advance of scientific rationality into economic, social and political spheres
- shift from property or political principles to knowledge as base of power

U.K. Prestel page - 1982



French Minitel system - circa 1988

Hunter / Gatherers

⇩

Agriculture

⇩

Industrial

⇩

Information-based (post-industrial)

In the Post-Industrial Society

- technocrats exercise authority by virtue of technical competence
- technocrats as power holders signal the emergence of efficiency, instrumentalism and pragmatic problem solving
- statistics take the place of history in an attempt to understand society

In the Post-Industrial Society:

- the three dominant 'industries' will be (are?) *Education*, *Health* and *Leisure* (Prof. Tom Stonier)
- technical skill becomes the basis of power (Daniel Bell)
- education becomes the mode of access to power (Daniel Bell)

Globalisation

- **the new currency**
- **communication**
- **access to information**
- **acceleration of change**

Global Perspectives
(the Modernisation theory)

- technological change raises standards of living world-wide
- solution to global poverty = increase technological expansion in developing countries
- rich developed countries help
  - encourage industrial growth
  - export technology

Global Perspectives
(the Dependence theory)

- legacy of colonialism
- global domination of wealthy countries purposely prevents development
- rich nations encourage dependency
- dominance of multinational corporations, influence in world politics
- examples: developing countries' economic debt, Western cultural domination, resource depletion to the benefit of developed world and multinational profits

Changes in Communication:

- access to information - anywhere, anytime
- publishing on demand
- publishing to a global audience
- terrestrial and satellite broadcasting

USA Central Command Iraq invasion briefing - March 2003

Baghdad Shopkeepers, Iraq, 2003

Travelling students texting home using SMS

Bedouin watching T.V. in the Arabian desert

Changes in technology hardware:

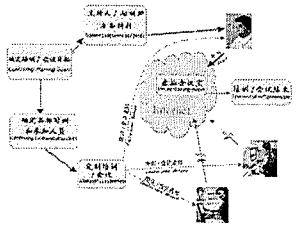
- miniaturisation
- memory capacity
- speed of operation
- cost
- the human-machine interface

Changes in software:

- graphics
- digitisation - images, video, sound.....
- translation
- prediction
- artificial intelligence

Changes in teaching and learning:

- impact on the school and the curriculum
- role of the teacher
- e-learning
- individualised learning
- lifelong learning



E-learning in China

The Digital Divide

Information + Education
=
Wealth

Using a satellite telephone in the 'bush'

Our Mission

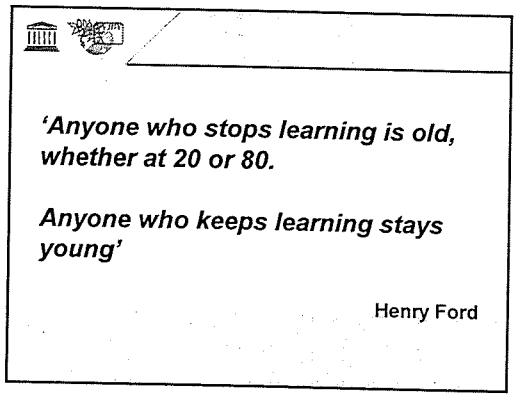
We at Lamar Elementary School believe that each child can succeed in a multi-cultural changing society. To succeed, all students must consistently master the basic skills of literacy, numeracy and ICT.

The purpose of Lamar is to provide a multi-faceted educational programme of learning excellence necessary to meet the demands of today's technological, information-based society.

We therefore accept the responsibility to teach all children in order that they fully meet their educational potential.

Primary school children in Baku, Azerbaijan

Tomorrow's Survivors will be:
flexible
adaptable
able to communicate
willing to co-operate
creative thinkers
investigators
(scientific, mathematical and historical)
able to handle information
researchers
lifelong students
comfortable with information and communications technology



'Anyone who stops learning is old, whether at 20 or 80.

Anyone who keeps learning stays young'

Henry Ford

Session 3

EDUCATIONAL PHILOSOPHY: MAIN TRENDS IN EDUCATION IN THE ERA OF GLOBALIZATION AND CONSTRUCTION OF THE KNOWLEDGE SOCIETY

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SESSION 3

Educational Philosophy: Main Trends in Education in the Era of Globalization and Construction of the Knowledge Society

Bernard CORNU & Katja van den BRINK

A. The context; information, knowledge.

B. The evolutions in Societies and implications for Education. Networking, cooperative work, globalization.

C. International Plans and Declarations.

D. What future?

E. Some principles for Educational Policies.

We have moved from computers and informatics...
... and from communication technologies

... to ICTs and networks

IT + CT ---> ICT

« Information and Communication Technologies »

Digitalized information: « 0 » and « 1 »

moving
interactive
multimedia
hypermedia
.....

What can be digitalized?

ICT for Education
tools, resources, concepts...

ICT in Education
integrate pupils in an « ICT Society »

Technology
Information
Knowledge

Information Society?
Knowledge Societies?

... « information ages »

"Information ages". The concepts of Information and Knowledge: a socio-historical view.

Katja van den Brink

Information ages

Literacy age

Numeracy age

Contemporary age of computers

Characterised by change of technology

Literacy age

Thesis: Abstract information was born with the development of literacy -writing by phonetisation, at many places (Nile delta, Mesopotamia -Euphrat & Tigris region) at similar times (2600 b.C.)

Literacy age

Pictogramm for aleph: bull

Consonant writing

A Alpha

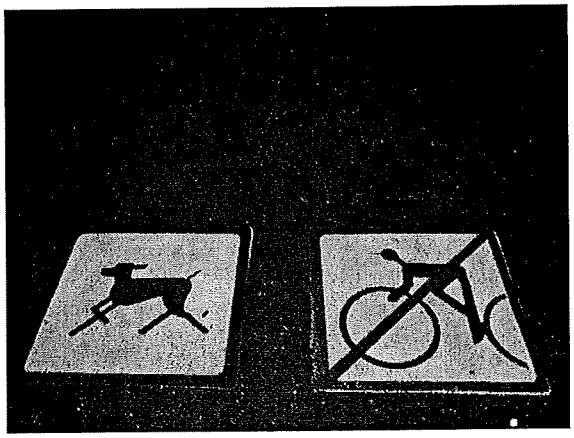
Example: Phoenician writing to Greek alphabet

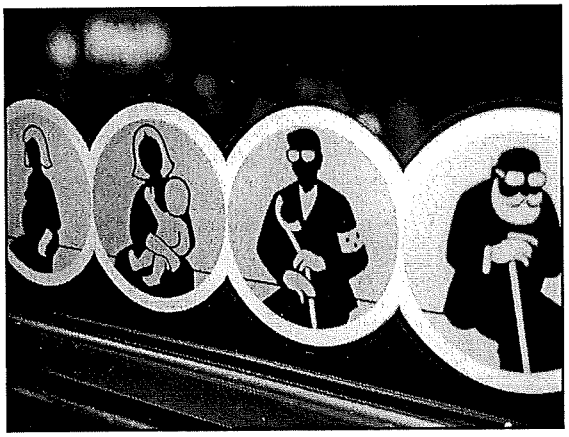
Literacy age

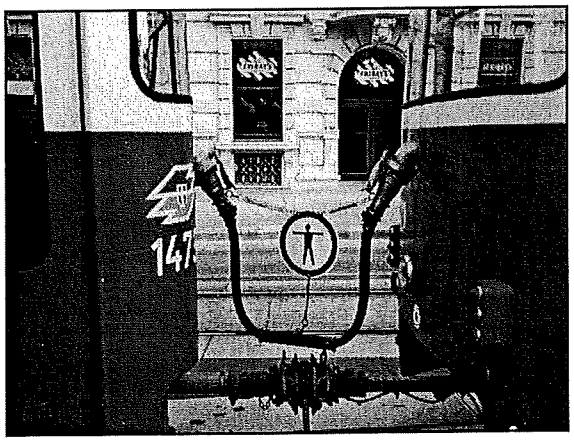
Rebus principle

Literacy age

What happened? The phonetisation is more abstract and broader usable than pictures or pictogrammes







Literacy age

Oral culture no distinction was made between content & experiences

Writing pulls the words from the things: creates new entities that exist APART from the flow of speech/ from the flux of experience

Writing = systematic approach to organize abstract mental world

This distinction gives birth to the mental object – called – INFORMATION –facts, data, news

By abstraction – abstrahere – something can be seen from more than one (critical) perspective

Literacy age

Why was it necessary to develop literacy?

(complexer societies: organised administation, trade exchange between different cultures, different religions)

Advantages of literacy:

Phonetisation enabled communication over space & time

Unlimited opportunity of variation of languages – every word in every language can be reproduced

Instrumental role for preserving information and later in accumulating it

Opportunity of reflection on cultural contents

Literacy age

Way of thinking:

Classification (starts with listmaking of the first literate peoples, later Greeks, Romans) , from general to specific; classification of the world and its miracles

Thinking in orders: moral order, natural order etc.

Numeracy Age

Invention of the Letterpress

Johannes Gutenberg
1450 first print of a book

Numeracy Age

Printing facilitates copying of texts
Reduces enormously the costs
Also less priviledged classes get access to learning
Use for propaganda (reformation Martin Luther, 1517
500.000 copies of the Holy Bible in German)
Language development: accuracy – uniform teaching texts
Critics: church – loss of power – censorship – no effect
National & international cultural & technological progress
45 % religious/ 30 % literature/ 10% legal and 10% science

Renaissance: Human being in the centre - , recovery of the antiquity, science revolution – New World discoveries

Numeracy Age

What happens? *Confusion* over the next two centuries: unimaginable number of books, overload with diverse & contradictory information – information explosion
The medieval worldview gets a critical analysis – analytic thinking starts to be the main way of thinking of the era.
Orders are questioned – era of skeptical crisis (Montaigne, Descartes).
Mathematics becomes a crucial position: provides a certain clarity
Divorce of exact knowledge (scientia) from wisdom (sapientia) – Two intellectual cultures were fostered: the scientific & humanistic

Numeracy Age

Mathematics: 17th century, investigations of physics & astronomy - led to promising results – as innovative information technology

18th century: encyclopaedias of organised knowledge based on the analytical vision

Mathematics: Leibniz & Euler: functions, integral (summatory) and differential calculus

End of 18th century: the modern information age, the change from classifactory to analytical information processing was established

Computer Age

Logic (Aristotle) and mathematics began to merge in 1820 (formal logic , de Morgan, 1849)

Boole , 185x, Boolean Algebra 1/0 innovation – prerequisite for the computer, it served as empty container for any information

20th century: Goedel/Russell uprooting of the analysis idea: a global uncertainty has replaced global foundations – but this loss did not provoke another intellectual crisis

Computer Age

Uprooting of analysis brought the modern information age to its end!

Of course: analysis is still practical and useful structure for forming much of our experience

Consequence: the technology of numeracy & the analytic idiom of knowledge could not provide anymore an all-inclusive abstract model of the universe

Computer Age

Analytic symbols found a new home: electronic computer – pure technique apart from any foundation of knowledge

Meaning or content (important in former i-ages) is replaced by logical rules – the information is so far away from our experience that no content is retained in its digital symbols

Nothing is fixed in today's information

Role of Technology

Depends on interests/goals/activities of the members of the society and their institutions (there is not always the need of writing & reading? …)

Information & Knowledge

Knowledge society: information as currency and as an input for constructing *knowledge*

The construction of knowledge – individually or collaboratively is perceived as getting more & more importance

Information & Knowledge

"Knowledge societies are about capabilities to identify, produce, process, transform, disseminate and use information to build and apply knowledge for human development" UNESCO Definition

Comparison to the other information ages: the centre is not anymore the search for the ultimate truth, multiple knowledges

"Freedom of expression; universal access to information and knowledge; respect for human dignity and cultural and linguistic diversity; quality education for all; investment in science and technology; understanding and inclusion of indigenous knowledge systems." UNESCO

Constructivism in Education

Current education philosophy of pedagogies includes the approach of constructivism.

Constructivism assumes that learning is effective when it is

Active/constructive/situated/cumulative and social

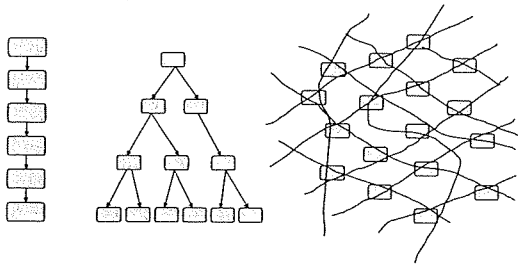
This form of learning mirrors the history of information technology.

Policy consequences

Providing opportunities for discussions/discourses on current education philosophy of pedagogies in broad pedagogical concepts on and for all educational levels

B. The evolutions in Societies and implications for Education
1. Networking...

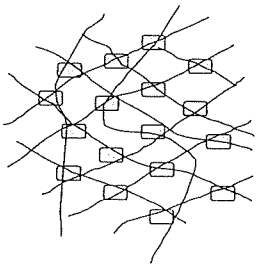
From chain to pyramid and to network...



B. The evolutions in Societies and implications for Education
1. Networking...

Network:

- Nodes and edges
- Nodes: information, people, knowledge, ...
- Complex
- Evolving
- Several paths from one node to another



B. The evolutions in Societies and implications for Education
1. Networking...

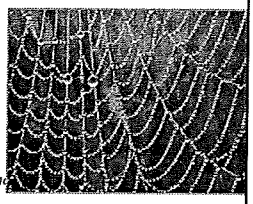
Communication:

one to one
one to all (media)
all to all

From hierarchical communication to networked communication

Free circulation of information, enhanced dem
or generalized control?
The dream of equality and cooperation in human relationship...

New kinds of hierarchies...
New frontiers...

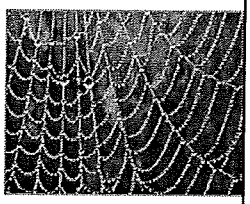


B. The evolutions in Societies and implications for Education
1. Networking...

Education in a networked society

· Education needs networks

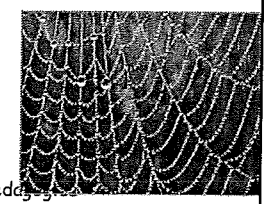
· The links (the edges): contribute to the elaboration and acquisition of Knowledge



B. The evolutions in Societies and implications for Education
1. Networking...

Education in a networked society

Take into account:
· new knowledge
· access to knowledge
· communication in a network
· new teaching, new learning
· new tools, new resources, new peda
· new space and time
· new teaching profession



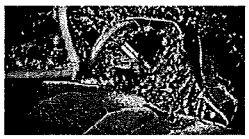
B. The evolutions in Societies and implications for Education
2. Cooperation, collective intelligence...

Individual / collective intelligence and capacities

Better understanding of each other

the networking society needs and reinforces a collective intelligence.

Example: ants



- Building bridges
- Transporting heavy loads
- Finding the shortest way
- Regulating the temperature

Stigmergy: indirect communication through the environment

Internet is mainly a tool, the more recent we found for **perfecting our intelligence through cooperation and exchange**... The true revolution of Internet is not at all a revolution of machines, but of communication between human beings... **Internet enhances our capacity for collective learning and intelligence**... Each community realises that it is one of the dimensions of the production of human sense... Internet forces us to experiment new ways of being together... The ethic of **collective intelligence, consisting in interlacing different points of view**... (Pierre LEVY, 2000)

Collaborative work

Virtual communities

Semantic web

New possibilities of collective intelligence

Education and collective intelligence:

- The classroom is the first place where collective intelligence can be built and used.
- Develop collective intelligence of students
- Develop the capacity for collaborative work
- Use collaborative work

Circulation of knowledge
Widely shared knowledge

Education and knowledge, considered at the world level

Advantages and risks...

A new citizenship in a globalized world

New roles for Education

Capacities for collective intelligence

- collaborating
- communicating
- being part of a virtual community
- being part of a collectively intelligent group
- collective dimension in teaching and learning
- practice collaborative work

B. The evolutions in Societies and implications for Education
4. New competencies in a networking society

Capacities for a networked society

- being part of a network
- working in a network
- contributing to a network
- communicating in a network
- accessing information and knowledge in a network
- collaborating in a network

B. The evolutions in Societies and implications for Education
4. New competencies in a networking society

Capacities for a networked society

- the classroom and networks
- the classroom,
  - new spaces (physical, virtual…)
  - and new times (synchronous, asynchronous)

B. The evolutions in Societies and implications for Education
4. New competencies in a networking society

Capacities for accessing information and knowledge

- finding the way, navigating,
- sorting,
- validating,
- evaluating accuracy and reliability
- storing, processing, sharing knowledge
- using and applying knowledge

C. International Plans and Declarations
1. « Education for All », Dakar framework for action

« Meeting in Dakar, Senegal, in April 2000, we, the participants in the World Education Forum, commit ourselves to the achievement of education for all (EFA) goals and targets for every citizen and for every society.
The Dakar Framework is a collective commitment to action. Governments have an obligation to ensure that EFA goals and targets are reached and sustained.
……
We re-affirm the vision of the World Declaration on Education for All (Jomtien 1990), supported by the Universal Declaration of Human Rights and the Convention on the Rights of the Child, that all children, young people and adults have the human right to benefit from an education that will meet their basic learning needs in the best and fullest sense of the term, an education that includes learning to know, to do, to live together and to be. »
……

C. International Plans and Declarations
1. « Education for All », Dakar framework for action

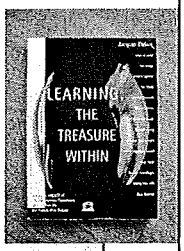
« We hereby collectively commit ourselves to the attainment of the following goals:
(i) expanding and improving comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children;
(ii) ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete, free and compulsory primary education of good quality;
iii) ensuring that the learning needs of all young people and adults are met through equitable access to appropriate learning and life-skills programmes;
(iv) achieving a 50 per cent improvement in levels of adult literacy by 2015, especially for women, and equitable access to basic and continuing education for all adults;
(v) eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girls' full and equal access to and achievement in basic education of good quality;
(vi) improving all aspects of the quality of education and ensuring excellence of all so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills. »

C. International Plans and Declarations
1. « Education for All », Dakar framework for action

« To achieve these goals, we the governments, organizations, agencies, groups and associations represented at the World Education Forum pledge ourselves to:

…
(x) harness new information and communication technologies to help achieve EFA goals; »
…

C. International Plans and Declarations
2. « Learning, the treasure within »



The four pillars of Education :

Learning to know
Learning to do
Learning to live together, learning to live with others
Learning to be

C. International Plans and Declarations
3. IFIP Montreal Youth Declaration

« We, participants in the **IFIP World Computer Congress 2002**
(...) Affirm our commitment to contribute to ensuring a **youth oriented *digital inclusion*** specifically in the fields of education, science, culture and communication,
Strongly recommend the following measures for empowering youth in the information age:
- promote the global access to information and knowledge sources of young people as a prerequisite to their competent social choice, behaviour and participation; disseminate information about issues having a practical impact on the every day life of young people;
-improve access to education and train young people in ICT skills enabling them to enter empowered into the information and knowledge society; (...)
(...)
- support the efforts of youth to foster a culture of peace, tolerance, sustainable development and quality of life by using global information and communication means;
(...)

Montreal, 29 August 2002

C. International Plans and Declarations
4. Vilnius WITFOR Declaration

« 1. **Nature of education:** The nature of education is to improve a person's relation to the world. The organization, methods, structures and objectives of education should be brought into alignment with the knowledge society.
2. **Lifelong learning:** ICT can allow education to be spread around many communities, and promote lifelong learning and capacity building for the whole community.
3. **E-inclusion:** ICT should be used to reduce the education inequalities. Women, unemployed and disadvantaged people (refugees, disabled, etc.) should receive special attention in this process. National contents must be developed in local languages.
4. **Computer literacy:** At all levels of education, computer literacy and ICT competence for the knowledge society should be achieved, adapted to local conditions.
5. **Teacher education:** Any educational system reform should start with teacher in-service and pre-service education. Teachers should be encouraged to acquire and use ICT equipment and skills."

World Information Technology Forum, Vilnius, Lithuania, August 2003

C. International Plans and Declarations
5. Communiqué, Ministerial Round Table, Paris 2003

(..)
2. Our Governments are committed to the improvement of the quality of life of our citizens and economic strength of our societies and to the achievement of an equitable and peaceful global community. The building of knowledge societies is an essential means to achieving these objectives and opens the way to humanization of the process of globalization.
3. Knowledge societies are about capabilities to identify, produce, process, transform, disseminate and use information to build and apply knowledge for human development. They require an empowering social vision which encompasses plurality, inclusion, solidarity and participation.
(..)
10. The following principles and parameters are essential for the development of equitable knowledge societies:
Freedom of expression;
Universal access to information and knowledge;
Respect for human dignity and cultural and linguistic diversity;
Quality education for all;
Investment in science and technology;
Understanding and inclusion of indigenous knowledge systems.

C. International Plans and Declarations
5. Communiqué, Ministerial Round Table, Paris 2003

Quality education for all
22. Access to education is a fundamental right, as well as a tool for combating illiteracy, marginalization, poverty and exclusion. ICT provides vast opportunities to effectively and affordably provide quality education for all.
23. It is only through quality education that the profound changes which we seek in our societies can be brought about. The opportunity to acquire an information culture, which encourages critical evaluation of information, should be an essential part of education at all levels.
24. We need to rethink and redesign our education systems and processes to meet the challenge of the knowledge societies - to find new ways of looking at information and knowledge according to which we have a right to acquire and a duty to share.
25. Considering the rapid advances in ICT and its application in development, regular upgrading of knowledge and skills of information and ICT professionals is imperative.
26. Teachers are the pivotal force for achieving these goals and should be involved from the beginning in educational reform. We recognize that sustained effort will be required.

C. International Plans and Declarations
6. Principles and recommendations, WSIS, 2003

(..) **We recognize that education, knowledge, information and communication are at the core of human progress, endeavour and well-being.**

(..)indicative targets may serve as global references for improving connectivity and access in the use of ICTs in promoting the objectives of the Plan of Action, to be achieved by 2015. These targets may be taken into account in the establishment of the national targets, considering the different national circumstances:

a) to connect villages with ICTs and establish community access points;
b) to connect universities, colleges, secondary schools and primary schools with ICTs;
c) to connect scientific and research centres with ICTs;
d) to connect public libraries, cultural centres, museums, post offices and archives with ICTs;
e) to connect health centres and hospitals with ICTs;
f) to connect all local and central government departments and establish websites and email addresses;
g) to adopt all primary and secondary school curricula to meet the challenges of the Information Society, taking into account national circumstances;
h) to ensure that all of the world's population have access to television and radio services;
i) to encourage the development of content and to put in place technical conditions in order to facilitate the presence and use of all world languages on the Internet;
j) to ensure that more than half the world's inhabitants have access to ICTs within their reach.

C. International Plans and Declarations
6. Principles and recommendations, WSIS, 2003

Action Lines

C1. The role of governments and all stakeholders in the promotion of ICTs for development

C2. Information and communication infrastructure: an essential foundation for the information society

C3. Access to information and knowledge

C4. Capacity building

C5. Building confidence and security in the use of ICTs

C6. Enabling environment

C7. ICT applications: benefits in all aspects of life (E-government, E-business, E-learning, E-health, E-employment, E-environment, E-agriculture, E-science)

C8. Cultural diversity and identity, linguistic diversity and local content

C9. Media

C10. Ethical dimensions of the Information Society

C11. International and regional cooperation

C. International Plans and Declarations
6. Principles and recommendations, WSIS, 2003

world summit on the information society
Geneva 2003 - Tunis 2005

C4. Capacity building

a) Develop domestic policies to ensure that ICTs are fully integrated in education and training at all levels, including in curriculum development, teacher training, institutional administration and management, and in support of the concept of lifelong learning.

b) Develop and promote programmes to eradicate illiteracy using ICTs at national, regional and international levels.

d) In the context of national educational policies, and taking into account the need to eradicate adult illiteracy, ensure that young people are equipped with knowledge and skills to use ICTs, including the capacity to analyse and treat information in creative and innovative ways, share their expertise and participate fully in the Information Society.

l) Develop distance learning, training and other forms of education and training as part of capacity building programmes. Give special attention to developing countries and especially LDCs in different levels of human resources development.

n) Launch pilot projects to design new forms of ICT-based networking, linking education, training and research institutions between and among developed and developing countries and countries with economies in transition.

p) Design programmes to train users to develop self-learning and self-development capacities.

D. What future? The OECD Scenarios

"Schooling for tomorrow ; what Schools for the future ?", CERI, OECD, 2001

Need for policy reflection on long-term future of schooling, and for clarifying the desirable and the possible.

D. What future? The OECD Scenarios

"Status-quo extrapolated"
Scenario 1: "Robust bureaucratic school systems"

Strong bureaucracies and robust institutions.
Vested interests resist fundamental change.
Continuing problems of school image and resourcing.

Individual classroom and teacher models remain dominant.
Growing use of ICT without changing schools' main organisational structures.
Teachers form a strong corps.
Role and status: continuation of the present situation.
Teaching is considered as an "individual art".

D. What future? The OECD Scenarios

"Status-quo extrapolated"
Scenario 2: « Extending the market model »

Widespread dissatisfaction leads to re-shaping public funding and school systems.
Rapid growth of demand-driven "market currencies", indicators and accreditation.
Greater diversity of provides and professionals, greater inequality.

Existing market features in education are extended;
governments encourage diversification.
New providers stimulated to come into the learning market.
The most valued learning determined by choices and demands.
There is a substantially reduced role for public education authorities
Entrepreneurial management modes are more prominent.
New learning and educational professions are created in the market.

D. What future? The OECD Scenarios

"Re-schooling"
Scenario 3: "Schools as core social centres"

High levels of public trust and funding.
Schools as centres of community and social capital formation.
Greater organisational/professional diversity, greater social equity.

Focus is on socialisation goals and schools in communities.
Schools: the most effective bulwark against social, family and community fragmentation.
Much attention is given to non-cognitive outcomes, values and citizenship.
School facilities open to the community.
ICT are used extensively, especially for communication.
Teachers have a high-level status.
Many other professionals, community players, parents, etc.

"Re-schooling"
Scenario 4: "Schools as focused learning organisations

High levels of public trust and funding.
Schools and teachers network widely in learning organisations.
Strong quality and equity features.

A stronger knowledge orientation. ICT extensively used.
Schools look like "learning organisations".
Flourishing research on pedagogy.
Schools management uses teams, networks...
Teachers enjoy favourable conditions and are highly motivated, R&D, continuous professional development, group activities, networking (including internationally).
Contractual arrangements might well be diverse, with mobility in and out of teaching.
"Networked teachers in a networked society".

"De-schooling"
Scenario 5: "Learner networks and the network society"

Widespread dissatisfaction with rejection of organised school systems.
Non-formal learning using ICT potential reflect the "network society".
Communities of interest, potentially serious equity problems.

New forms of co-operative networks.
Abandonment of schools in favour of learning networks.
The emerging "network society" leads to dismantling of school systems.
Small group, home schooling and individualised arrangements.
Substantial reduction in public facilities for schools.
No longer reliance on "teachers": New learning professionals emerge, consultants (home teaching, educational "hot lines", office consultancy...).

"De-schooling"
Scenario 6: "Teacher exodus - the meltdown scenario"

Severe teacher shortages do not respond to policy action.
Retrenchment, conflict, and falling standards leading to areas of "meltdown", or
Crisis provides spur to widespread innovation but future still uncertain.

Teaching profession rapidly ageing, less and less attractive.
ICT appear as a possible response to teachers shortage.
Salaries increase in order to attract more teachers,
but it has detrimental consequences for investments
(ICT and physical infrastructure).
A major difficulty in recruiting enough teachers,
the market of "school at home" is developing, with new types of professionals.

The desirable and the possible...

Which Society do we aim at?

Which parameters for mastering the evolutions?

Which short term decisions for long term evolutions?

Questions for Principles...

1. Generalization: ICT in education for All, not only for the most involved and enthusiast...
2. Integration: ICT is not just one more subject; it has to be integrated in all subjects and in all dimensions of education.
3. Learning is central, technology only provides new tools and resources.
4. Education is strongly linked with Life Long Learning.
5. Cooperative work, team work, collective intelligence are central and are enhanced by ICT.
6. ICT enhances constructivist approaches.
7. ICT enhances individualization of learning.

Questions for Principles...

8. In the knowledge society, we have to rethink knowledge, contents, pedagogy, learning, and not only put the new technology on the old contents and pedagogy.
9. Educational policies must enhance intellectual freedom, and diversity and plurality in education.
10. Ability to evolve and adapt is central and must be addressed in learning.
11. A policy must address new ethical questions.
12. In the ICT society, educational policies must preserve that knowledge is a public good and education is a public service.
13. A policy must be linked and coherent with international declarations and common aims, but also with very local policies (school projects, communes, etc.).

E. Some Principles for Educational Policies

Questions for Principles...

14. A policy must be global and address simultaneously all the necessary aspects, such as: main aims of education and learning, national projects, national bodies, national documents, short term and long term schedule for implementation, hardware equipment, content and software provision, development of networking, distance and communication facilities, teachers skills and teacher training, place of ICT in the curricula, quality, indicators and evaluation, research and development programmes, ...

UNESCO INSTITUTE
FOR INFORMATION TECHNOLOGIES IN EDUCATION (IITE)

High Level Seminar for Decision-Makers and Policy-Makers
from South Eastern Europe

Towards Policies for Integrating ICTs into Education

16-20 February 2004, Bucharest, Romania

Thank you!

Session 4

THE ROLE OF ICTs IN MODERNIZING EDUCATION: NATIONAL POLICIES, STRATEGIES AND PROGRAMMES

SESSION 4

The role of ICT in Modernizing Education: National Policies, Strategies and Programmes

The French Policy for integrating ICTs into Education: Some main issues

http://www.educnet.education.fr/eng/

Presenter: Bernard CORNU

In the past, many successive National plans, based on:

- Hardware equipment
- Production of Software
- Teacher Training

- Main causes of failures:
  - Hardware before training
    (i.e. hardware without usage, without need)
  - Lack of maintenance and technical assistance
  - Lack of professionalism in software design
  - Teacher training not always appropriate, in methods and in content

---

Priorities:

Infrastructure, equipment and support:

SDET: Masterplan for work environments; rules to be respected by and recommendations for work environment designers.

User support services

Shared responsibility for equipment and networking with local authorities

---

Priorities:

Teaching and Resources:

Content Provision: The Digital Space of Knowledge (an online set of resources; the « fundamentals »); « RIP » label;
Digital Publishing Scheme for Education;
Usage; scenarios for usage, scheme for usage.

Prevention of Illiteracy

IT and Internet Certificate (B2I)

Priorities:

Higher Education:

Digital Campuses

Prevention of Illiteracy

IT and Internet Certificate (C2I)

A Portal for ICTs in Education: EDUCNET

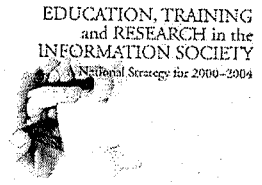
_____ http://www.educnet.education.fr/eng/

A portal for ICTs in Teacher Training:

http://www.iufm.fr/f_tic.htm

Current strategy

Finnish Ministry of Education (1999)



http://www.minedu.fi/minedu/publications/online.html

Vision

"By the year 2004 Finland will be one of the leading knowledge and interaction societies. Success will be based on citizens' equal opportunities to study and develop their own knowledge and extensively utilise information resources and educational services. A high-quality, ethically and economically sustainable mode of operation in network-based teaching and research will have been established."

Finnish Ministry of Education (1999)

Foci of the strategy

- Information society skills for all
  - Proliferation of Information society skills
  - Intensified teacher education
  - More and better ICT and New Media professionals
- Extensive on-line education system
  - net based learning environments
  - virtual university & virtual school
- Enhancing provision of electronic learning materials
  - in special attention of the entire government
- Strengthening of support structures

Finnish Ministry of Education (1999)

Coverage

- All formal education
  - Primary and secondary
  - Vocational
  - Tertiary level
- Lifelong learning
- Research
- Public libraries (educational functions)
- [A parallel strategy for content production]

Finnish Ministry of Education (1999)

Funding and mobilisation

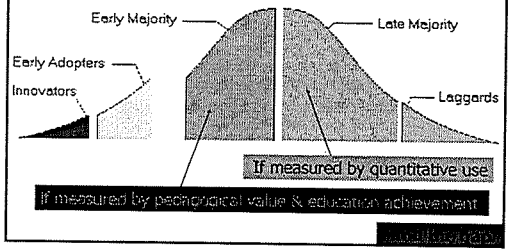
- Ear-marked in the national budget ca 45 M Euros / year *
- Substantial contributions from
  - local authorities
  - public technology funds
  - EU programmes
  - private sector
- Annual implementation plan

*Average extra funding 1996-2000 M Euros 45 / year.

Finnish Ministry of Education (1999)

Is ICT still emerging to or already transforming of Finnish education?

ICTE & Moore's Chasm



Students per Computer

Level	Students / PC 1999
Primary	12-13
Lower secondary	11-12
Upper secondary	9-10
Vocational	5-6
HE	2-50

Finnish National Board of Education, 1999

Obstacles to the use of ICT according to university administrators

Teachers' lack of time	4.1
Teachers' ICT skills	4.1
Teachers' reserved attitudes	3.7

teachers

Teachers' lack of time	3.7

students

Student workstations	3.5
Students' lack of time	3.4

(Scale: 1= poor skills, 5=excellent skills)

Knowledge and Skills of Teachers

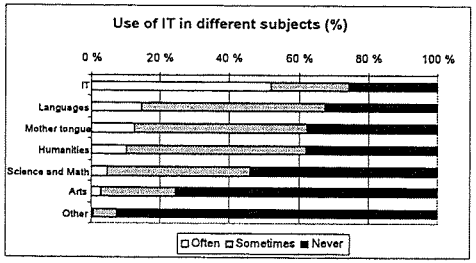
- One out of four teachers only feel confident with their present ICT skills and with their pedagogical competence to use ICT
- Two out of three teachers would like to get more training and more support in ICT and in ICT based teaching and learning

ICT skills of students (10-18): "I have good skills in..."

	1996	1999
• word-processing	35 %	45 %
• installing software	25 %	32 %
• downloading from web	15 %	35 %
• emailing	6 %	50 %
• web-browsing	12 %	56 %
• copying files	9 %	42 %
• graphics	-	9 %
• desk-top publishing	3 %	3 %

Juha Nurmela, Statistics Finland, 2000

Use of ICT in schools according to students in 1998

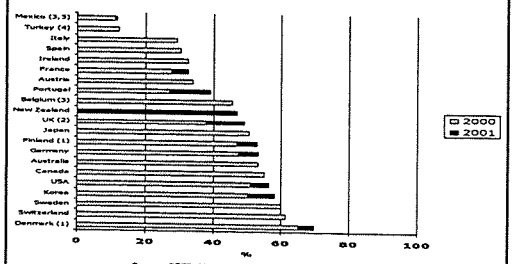


Usage of PC in schools during the autumn 1996 and 1999 (%)

Year	10-15	16-18	All
1996	76	52	72
1999	81	81	81

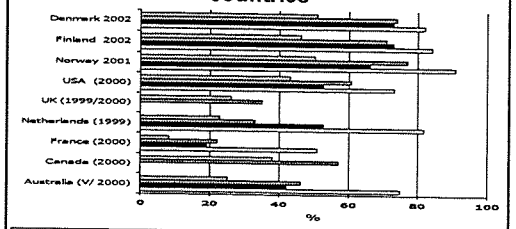
Juha Nurmela, Statistics Finland, 2000

Households with access to a PC of all households (%) in selected countries



Source: OECD, Measuring the Information Economy 2002.

Penetration on PCs and Internet in homes with and without children in selected countries

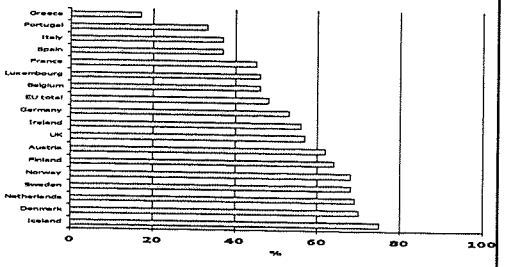


Source: OECD, Information Technology Outlook 2002 and National Statistical Institutes in the Nordic Countries.

ICT and social exclusion
(the digital divide)

Haves	Have-nots
young	elderly
male	female
wealthy	low-income
southern & urban	unemployed
well-educated	living in remote areas
technology & science-oriented	non-academic
	humanities-oriented

Internet users in EU countries of the population over 15 (%) in 2001



Source: Flash Eurobarometer, n:o 112 Internet and the general public.

ICT in Education: base-line

2001:
All schools on the Internet

- primary 100 %
- lower secondary 100 %
- upper secondary 100 %
- vocational 100 %

Finnish National Board of Education, 2002

ICT in Education– Lessons from Finnish Experience

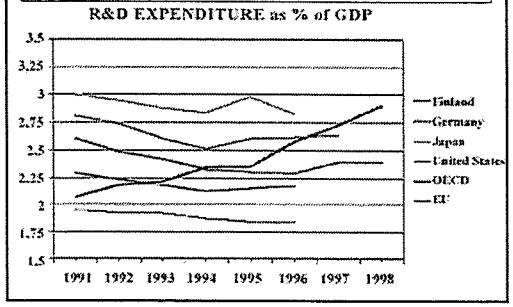
IITE Balcan Seminar
February 2004
Matti Sinko
msinko@sadc.int

ICTE in a larger (global & national) context

Rationales for Finnish National Information Society Strategies of 1990s and beyond

- anticipating global technological, economical and political changes
- securing competitiveness of the Finnish economy in the changing world, hence
- restructuring the national economy
- restructuring the whole societal infrastructure
- preventing social exclusion and disintegration

Trends of R&D Investments



Factors of Finnish Success Story

- trimming the liberalised economy
- membership in the EU
- information society strategies
  - investing in R&D, especially in hi-tech
  - investing in ICT industries
  - investing
    - in education
    - in training of ICT professionals and
    - in ICTs in education
  - liberalising telecommunication
- NOKIA as the flagship

Information society readiness

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Towards Policies for Integrating ICTs into Education

16-20 February 2004, Bucharest, Romania

SESSION 4

The Role of ICT in Modernizing Education: National Policies, Strategies and Programmes

Presenter: Matti Sinko

Warm-up questions for the session 4

What/who are the driving forces in your country advocating the use of ICT in education?

Role of

- Parents
- ICT and telecom industry
- Other industries
- National Government
- Education ministry
- Local authorities
- Schools
- Students
- Public opinion
- Other?

What are the arguments used for going e?

Who are the critics?

- Parents
- ICT and telecom industry
- Other industries
- National Government
- Education ministry
- Local authorities
- Schools
- Students
- Public opinion
- Other?

What are the arguments used against going e?

Romania

A case study

Complementing viewpoints from past experience in various countries

Country	Background factors	Threats	Strengths	To improve	Successes
Finland	Solid economy and high-performing education system	Slow scale up of integrating pedagogical and ICT intensive reforms	Strong infrastructure and public and political support	Curriculum integration and domestic software development	Large scale professional development programmes for teachers
France	Hardware before training	-Lack of maintenance and technical assistance -Lack of professionalism in software design -Teacher training not always appropriate			
"Denmark"				Lessons to be learned from pilots	
"Switzerland"					
"Portugal"					
"Germany"					
The UK					Lap-top to teachers initiative Lotteri scheme

04-2

SIVECO
AEL vers. 3

SEI Romanian National Project

FOR THE UNESCO IITE SUB_REGIONAL PROJECT Conference
FEB. 2004

17.02.2004

Romanian Ministry of Education, Research and Youth

SIVECO
AEL 4

Summary

- Project overview
- AEL system details
- Benefits and advantages

2

Romanian Ministry of Education, Research and Youth
2/17/2004

SIVECO
AEL 4

Summary

- Project overview
  AEL software within SEI program
  - Situation analysis
  - The SEI program
  - Architecture overview
- System details
- Benefits and advantages

3

Romanian Ministry of Education, Research and Youth
2/17/2004

SIVECO
AEL 4

Project overview

- IT enabling under-graduate Romanian education:
  - High schools are provided with IT solutions:
    - Hardware
    - Learning & Content Management System (AEL v4)
    - Educational content
    - Training of teachers
  - Development and support for SEI educational portal http://portal.edu.ro
  - IT support for projects regarding administration

4

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AEL 4

Situation analysis: the SEI program

- National Program for Accession of Romania to the European Union:
  - Short- and medium-term priority – IT classrooms + IT aided education in primary and secondary schools

SEI (Educational IT-based system) is the centerpiece of the program
- Phase I approved and executed in 2001 (120 schools)
- Phase II executed (1200 schools)
- Phase III in execution 300 schools

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SIVECO
AEL 4

Dimensions

- The SEI Program was launched in 2001
  - Approved by GPTI and by the government in 2001
    (Grupul pentru Promovarea Tehnologiei Informatiei, a governmental organism)
    - Estimated value: 200 mil. USD
- Probably unparalleled dimensions:
  - 1320 schools already provided with hardwarereprezentând:
  - 33000 modern PCs
  - 1320 servers
  - 1320 networks
  - >2600 network administrators trained
  - >14 000 teachers already trained

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Architectural overview

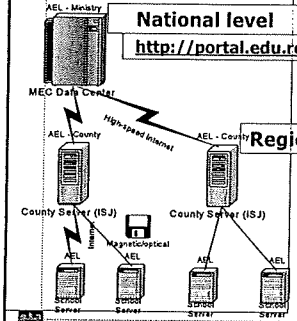
National level

http://portal.edu.ro

National structure composed of local nodes, communicating with national and regional centers

Regional level

Local level



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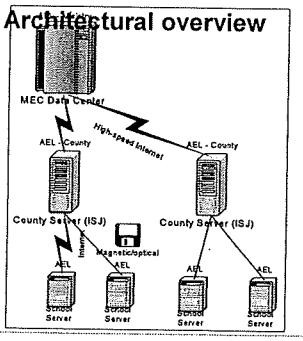
Architectural overview



Software updates
Educational material (manuals, tests, multimedia presentations, interactive materials, etc.)
Remote control lab sessions

8

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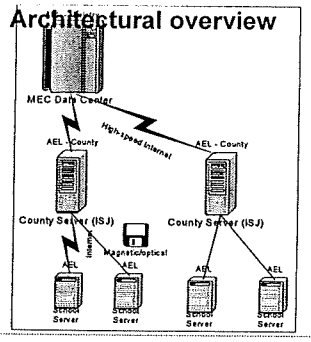
Architectural overview



Primary data (structure of student body, grades, structure of staff, assets, etc.)
Feedback
Proposals for original educational material
Backups of data

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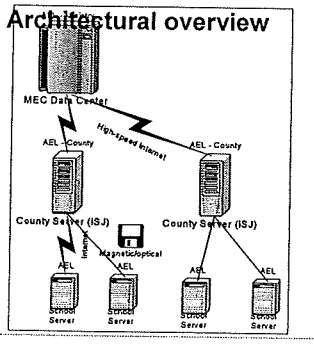
Architectural overview



Teachers' communication (forums, best practices, etc)
Students' communication (forums, chat rooms)

10

Romanian Ministry of Education, Research and Youth

2/17/2004

Summary

- Project overview
- AEL system details
- Benefits and advantages

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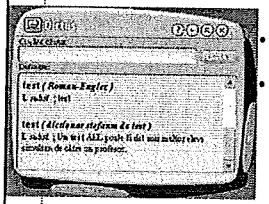
Romanian Ministry of Education, Research and Youth

2/17/2004

- AEL - modern, standards-based LCMS
- Perfectly adapted to Romanian education system
- Functions for all "actors" of education process (pupils, teachers, secretaries, school managers, parents, Ministry officials)



- Can function autonomously within any school
- Can communicate with peer schools and with Ministry servers

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2/17/2004

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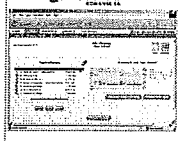
AEL 4



Local school system – key components detailed

- Content management – knowledge base
- Multimedia, interactive electronic content

- Functions
  - Content creation
    - built-in editors for: html, math formulae, tests, glossaries/dictionaries
  - import/export for content packages
    - Files
    - archives/folders of resources
    - standard packaging formats like SCORM and IMS.
  - adapt or modify content
  - organize content into courses
  - derive their own courses
  - Configurable access privileges
  - Hierarchical navigation, filtering, searching

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AEL 4

Local school system – key components detailed

- Testing and evaluation
  - Electronic testing, with assistance for grading
  - Various pre-defined templates for creation of tests
  - Configurable grading algorithms
  - Random selection and random order of questions
  - Electronic management and integration of test and study records
- History of each student's courses and evolution; "knowledge map"
- Online learning
  - Broadcast server
  - Pupil tracking sub-system (backward-streaming)
  - Screen synchronization module
  - Chat
  - Interactive testing
- Off-line learning

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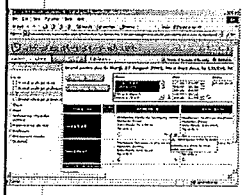

Local school system – key components detailed

- System administration

- School administration
  - Administration of classes/pupils, class-rooms, school's and pupils' records, archives, scheduling
- Activity monitoring
  - Uses all the modules above for specific reports, for the use of the school or for supervising organizations

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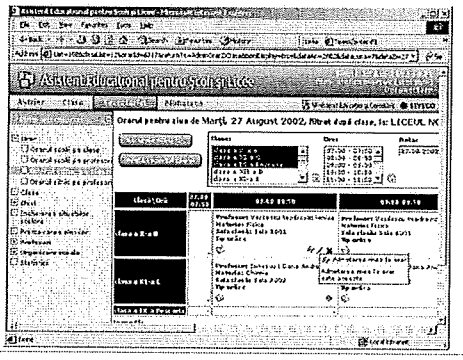
AEL 4



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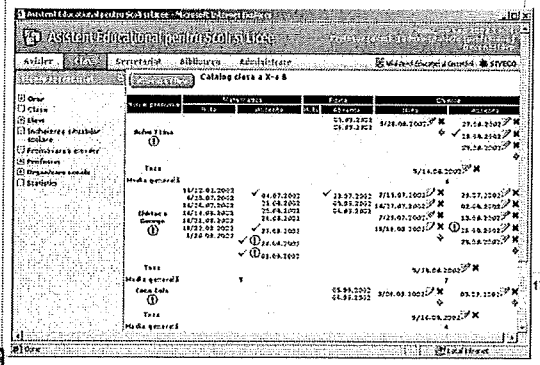
AEL 4



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SIVECO ROMANIA SA

AEL 4

AEL Implementation

- Standardized implementation methodology (SIVECO Romania is ISO 9001/2000 certified).
  - Includes:
    - Installation of AEL software
    - Distribution/installation of educational content
    - Training of teachers (min. 6), administrators, secretaries, librarians, even pupils
    - Personal technical support
- 2-step implementation; includes post-checking regarding
  - ...the quality of the original implementation
  - ...the impact on education

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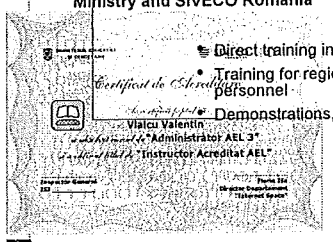
AEL Training

- Official certification scheme agreed between the Ministry and SIVECO Romania
  - Direct training in schools
  - Training for regional and national personnel
  - Demonstrations, seminars, presentations



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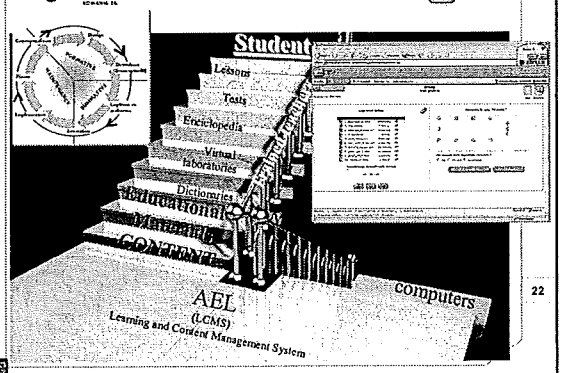
Educational content

- Development, distribution, support for independent developers/vendors, especially from inside the educational system
- Organization of the National educational software contest SIVECO Cup 2003
- Sponsorship of several software contests
  - Main sponsor of the 11th Edition of the Balkans' Olympics in comp programming, Iaşi 2003

ADLIC 2001, 2002, 2003

- National school network database consolidation
- Candidate's details and options were collected in each school
- On-line support applications for the public
- Publishing of results
  - Reports listed in each school, high-school, county
  - Web: http://portal.edu.ro
    - 450,000 individual users in one week
    - 220,000 individual users in the 1st day
    - 36 mill. requests
    - 14 million reports (pages) displayed
    - 650,000 simple searches
    - 200,000 advanced queries against the results database *(2003 statistics).*

21



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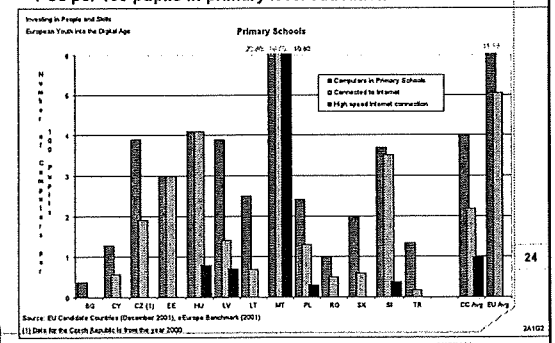
Summary

- Project overview
- AEL system details
- Benefits and advantages

23

PCs per 100 pupils in primary level education



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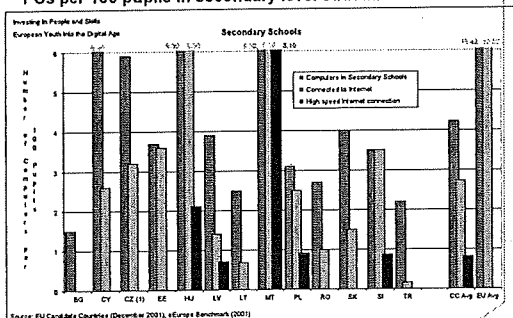
SIVECO

AEL 4

PCs per 100 pupils in secondary level education



Source: EU Candidate Countries (December 2001), eEurope Benchmark (2001)

(1) Data for the Czech Republic is from the year 2000

2A1G3

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Internet conection

Highschools	Connected			
	Permanent		>64k	
	Nr.	%	Nr.	%
1365	665	49%	366	27%

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AEL 4

Indicatiors

- Quantity
  - #computers/100 schools
  - #schools with INTERNET access
  - #schools with >64K internet access
  - Etc
- Quality
  - Metrics for formative issues
  - Metrics for psycho pedagogically aspect
  - Metrics for social impact of IT&C in education

SIVECO

AEL 4

Benefits and advantages

- Migration from "Learning by memorizing" towards "Learning by doing"
- Emphasis on
  - problem-solving
  - searching and using the information
  - cooperation and team-work

  rather than on memorizing
- Stimulating creativity and competition

SIVECO

AEL 4

Benefits and advantages

- Encouraging innovative teaching and learning
- Offering simulation software for didactic materials that cannot be afforded by all schools (e.g., lab instruments)
- Management support for school managers and MECT
- IT literacy for students and teachers

SIVECO

AEL 4

Perspectives

- SIVECO started eLearning research and AEL development in 1999
- AEL vers. 2.1 – first public release in sept 2001
- AEL vers. 3.3 – second release
- AEL vers. 4.0 – actual
  - Includes:
    - Advanced document indexing and retrieval
    - New synchronous and asynchronous communication features
      - Chat, moderated discussion forums, announcements
    - Supplementary activity monitoring features
    - Tools for web-based updates of library contents
    - Embedded dictionary/glossary tools
      - Stand-alone win32 app. and web-based module
    - Customizable user roles for function-based security added on customizable user groups for data-level security.

SIVECO

AEL 4

Contact

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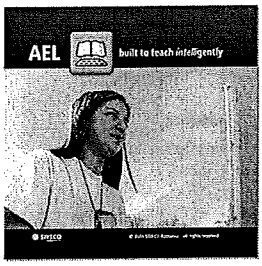

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Romanian Ministry of Education, Research and Youth

2/17/2004

RM-4

- EUN
- EENet
- iFiP

Laptops for teachers

Mainly Funded by Central Government

1 Pilot
2 50% funding
3 For KS3 Mathematics teachers
4 Via local authorities (100% funding)

Laptops for teachers

A consultation exercise was run during the summer of 2001 for teachers and members of the education community to express views on how future Computers for Teachers schemes should be shaped. The consultation did not produce an overwhelming demand for any one type of supply model. This initiative retains the emphasis on personal access for teachers but leaves the ownership of the laptops with schools.
This model has a number of advantages, not least because it will ensure better value for money.
Previous Computers for Teachers schemes operated on a subsidy basis and attracted income tax and National Insurance liabilities.
By moving to a model where the ownership of the equipment is retained by the school these liabilities are avoided.

Laptops for teachers

On 9 January 2003, Charles Clarke, Secretary of State for Education and Skills, announced a substantial increase in funding for this popular initiative.
The funding for 2003-04 has been increased by £20 million, bringing the total to £60 million. The initiative has also been extended for a further two years, with £90 million available for 2004-05 and another £90 million for 2005-06.
This trebles the funding originally announced last year and brings the total allocated for this initiative to £300 million over four years.

Laptops for teachers

Another key feature of this initiative is that head teachers have priority to receive a laptop first.

All teachers who have a laptop through the scheme have a personal email address and receive a regular newsletter and support on-line from BECTa

In-Service Teacher Training

1 £230,000,000 funded by National Lottery 'profits/surplus' over 3 years
2 Administered by Teacher Training agency (Min of Ed)
3 ~50 training providers
4 650,000 serving teachers involved (~£500 voucher)
5 On-line, face-to-face or mix
6 Quality assurance

In-Service Teacher Training

- Much dissatisfaction from teachers – especially Secondary
- Objectives not clearly stated and tested
- QA too little and too late
- Little or no software included
- Lack of quality trainers
- Expectations of teachers' prior skills attainment too high

ICT in Education: Facts and Measures in Germany

Presenter: Katja van den Brink

Pre-Considerations

- Germany: Re-Unification in 1990
- Federal Constitution: 16 Länder with 16 Ministries of Education
- Educational System: Reformation in the 70ies
- Results from the PISA Study 2001

ICT in Germany

- almost each household has a computer
- 35 million people over the age of 14 have Internet access

ICT in Education

- all schools equipped with Internet Access 2001 (1998 only 15 %)
- 40 students per computer (demanded by the EC: 5 – 15 per computer, 44% multimedia computers)
- High speed Internet access for all Higher Education institutions

Federal Government Measures

Programme period 1999 – 2005, i.e.

Internet for All - "IT in Education – Connection not Exclusion" (Women on the Net; access for people with disabilities etc.)

German Education Server (www.bildungsserver.de)

New media in Education: Developping teaching & learning software

Network-based learning

School Sponsoring

Teacher Training

EU Integration

eEurope 2002 European Action Plan with binding quantitative targets

Länders` Activities

- Different Conditions
- Different measures: media-corners; one computer each class; new teachers are equipped with notebooks; Länder-Servers; hardware4friends; ambassador programme etc.
- Teacher Training and Teacher Education
- ICT as administrative support for learning

Future perspectives of the Government

- Trainings in ICT skills
- Didactical and methodological concepts
- Virtual studying
- Creation of the Notebook University
- Widespread hardware & software of high quality

Conclusions

- Use of ICT in Education varies within the educational institutions
- Varies qualitatively and quantitatively from region to region
- ICT is not widespread used in German schools, universities and other educational institutions
- Still high focus on hard- and software and less on broad concepts

Session 5 New Pedagogy for New Education :Pedagogical issues
(New paradigms of knowledge and knowledge building, new teaching, new learning, lifelong learning, etc)
Main Presenters: Katja van den Brink and Raymond Morel
Chair: Matti Sinko
Reactors

Background
According to the objectives (cf. below) of this session, it is very important to open some ways to prepare the participants to react, reflect and adapt their own context.

Objectives	• To illuminate the prevailing pedagogical conditions to be taken into account in design of a policy frame for integrating ICTs into education • To help in drawing guidelines for ensuring the judicious use of ICTs while keeping in view the gender, medium, and curricular considerations • To outline approaches to resolving the dilemmas emanating from the diversities of roles of learners, teachers, assessors, and community • To outline main features of new pedagogy for different types of education, e.g. distance education and Net-education

Deep Self-regulated Learning with ICT: Prerequisites for its Implementation in Education

The new paradigm of constructivism in the field of teaching and learning offers many new teaching and learning perspectives. Two of them should be presented here in more detail. The first concept , self-regulated learning is mainly based on empirical research in the field of educational psychology. When self-regulated learning with ICT, the the learner is able to

determine his/her learning needs & goals
identify resources (books, people, ICT etc.)
chose & use adequate learning strategies according to the aims and resources
monitor the learning process
evaluate the learning state/results
start again the self-regulated learning process if the evaluation demands the improving of the learning results.

The second concept, approaches to learning, derives from qualitative research on the way, learners approach their learning dependently of their learning motivation, their learning aims as well as learning evaluation. When deep learning with ICT, the learner
is intrinsically motivated: he or she enjoys & continues learning, is curious & is interested in the content of the learning task
is independent of external rewards
has a personal commitment to the ongoing learning process

and employs specific cognitive & meta-cognitive strategies.

ICT has a huge potential for supporting a deep and self-regulated learning due to its specific characteristics such as
Interactivity/Simulations
Feedback function
Complex interrelations
Independency of time & locality

The individualising learning is possible with ICT, learners can process their learning according to their own pace and level of difficulty, they can decide on their own their learning routes. However, certain ICT such as Internet or Multimedia encyclopaedias offers besides these positive characteristics also the opportunity of getting quickly lost in "cyber space".

How can we combine deep-self-regulated learning with the specific characteristics of ICT? Important is, that teachers and students need to construct knowledge on learning concepts such as motivation, learning strategies, meta-cognition etc.. They need to get familiar how to use which strategies under what circumstances as well as how to individualise the use of strategies in learning with ICT in order to use the potential of these new technologies. Furthermore, a student-centred & student- activating method of teaching & learning with ICT is necessary to support a deep construction of knowledge. The adaptation of ICT learning material to these concepts is crucial and needs to be established by the collaboration of different expert groups on learning. Also the evaluation of the students` learning performance has to be considered.

E-Portfolio Assessment

A new alternative evaluation method for assessing students` performance is the Portfolio Assessment, which can be used also as an e-version. The Portfolio Assessment allows a
qualitative Assessment of students` performance and
collection of students` work concerning a given learning task/goal: assignments, written works, photos, drawings, multimedia, feedback, log book.

Objectives of the Portfolio Assessment is dealing with the new technology: how to produce multimedia (with Word processor, Powerpoint, Photoshop, Flash, Dreamweaver, Illustrator) within a given context (academic authentic task). A good example of best practice might be the portfolio of a Swedish teacher student on an e-Portfolio on integrating and producing textiles in the classroom (http://elwa.ilu.uu.se/IKTiS02/maria/door.htm).

Advantages of the Portfolio Assessment are the following ones:

It provides insights into learning processes and related changes.
The emphasis is on change or growth in the process at multiple points in time.
It is a tool to foster communication and accountability to teachers and other students.
It allows to see the students as individuals – each portfolio is unique.
It provides a basis for future analysis and planning.
It promotes a shift in ownership.
It promotes collaborative work.
It offers a more complex evaluation.
It covers a broad scope of knowledge and information from many different sources.

But of course, there are also disadvantages. The Portfolio Assessment is less reliable or fair than qualitative evaluation methods and it is very time consuming for teachers and learners. The development of criteria can be difficult and unclear goals and criteria can lead to an unorganised collection. Finally, it is difficult to analyse the data.

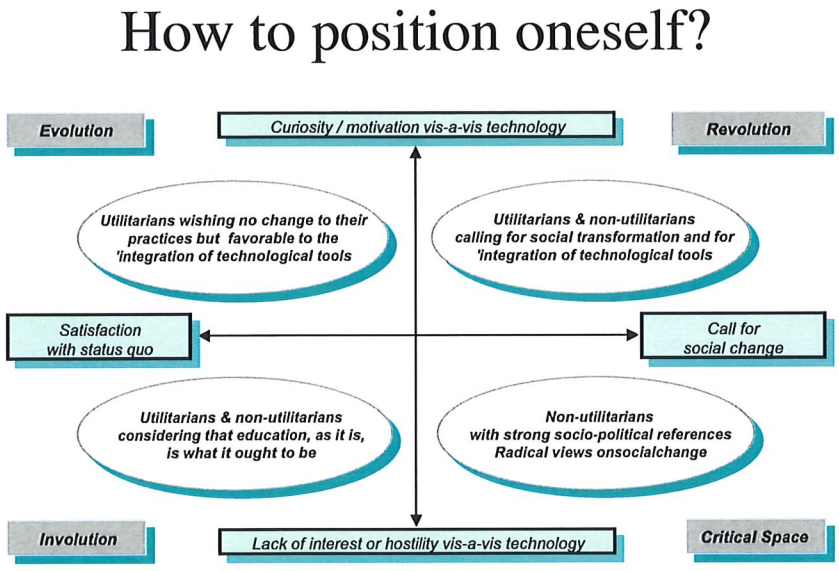
Policy decision makers might consider the following recommendations:
The implementation of high-level, profound and ongoing teacher & learner education with pedagogical concepts should be developed and process-like provided.
Policy measures should focus more on broad concepts of pedagogical measurements instead of focussing on narrow on hard- and software (teacher education, Action research, competencies of teachers etc.).
A hard- and software equipment should be provides as well at primary as on secondary level.
The evaluation and the development of ICT application should be Systematical & scientifically based and used in the classroom for preventing a surface/passive approach to learning.
A further focus should be on the broad potential of ICT by using research results.
ICT learning material & evaluation instruments should be adapted to these concepts.
Compatible soft- and hardware (also by fundraising?) should be provided.
Changes in the school curriculum have to be established: less is more - the focus should be more on interdisciplinary learning and within the subjects the focus should be more on knowledge construction of concepts and learning strategies than on facts and numbers.

Introduction of a methodology (OPA) to balance powershifts
The metaphore of the "Christmas Tree" illustrate the evolution from a static information world based on paper to dynamic information world with numeric network and the necessity of cohabitation between tree and networking.

After a brief reminder of the 6 OECD scenarii for the school of the future, it was pointed the way to enroled some powershifts into the reflexion through a methodology called OPA (Organiser Per Anticipation).

As illustrations, we can put in action among a set of considerations :

"Teaching vs Learning" against "ICT user vs ICT reluctant"



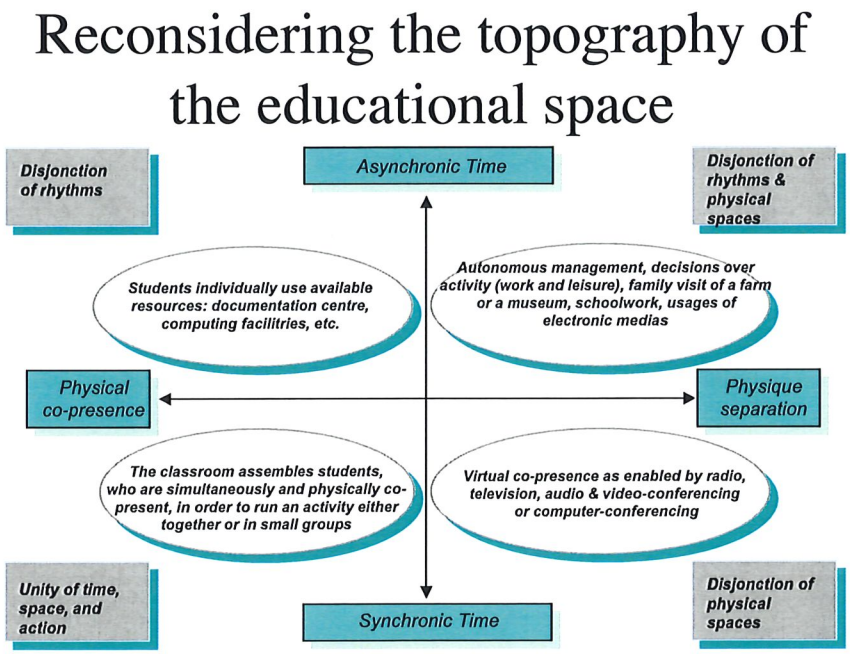
Many teachers set themselves up educationally within a perspective which can be described as ideologically Non-Utilitarian or Non-Instrumental. Their first concerns are for the socialisation and blooming of the pupils entrusted to them. They are also very much concerned with initiative, creativity, individual responsibility, democracy, etc. Three position are available to them:

- They are actively looking for change but they are not interested in technology use (whether they are just passive or hostile). They tend to consider the problem of education as social and political problems. For them the solution must rely on the levelling of social inequalities so that school has far more urgent calls than the use of technologies.
- They are actively looking for change and for the development of technology. They tend to consider technology as a first order opportunity to deeply transform both educational and societal perspectives.
- They are both passive as far as social change and technology are concerned. They tend to consider that school is what it ought to be. School allows for the development of the Non-Utilitarian perspective to which they adhere and for the transmission of the values of social and individual development for which they position themselves. In such a perspective, technologies are perceived as having nothing to offer to school.

Symmetrically many teachers set themselves up educationally within a perspective which can be described as ideologically Utilitarian or Instrumental. Their first concerns are the acquisition of knowledge and skills, standardised social behaviour, professionalisation and a capacity to integrate the job market place.

- They are actively looking for technology, but they are not interested in change. They tend to consider that technology can help them to do what they already do but faster or better.
- They are actively looking for change and for the development of technology. They tend to consider technology as a first order opportunity to rich the objective of education, to renew its organisation and thus to contribute to social change.
- They are both passive for change and technology. They tend to consider that school is what it ought to be and is in no way concerned with the development of technology.

"Synchronous vs Asynchronous" against "Same location vs At distance"



The literature on the practice of "flexible", "distant" or "open" learning bears mainly on the very distance itself, the relations between that distance and the modes of communication involved, and what is put at a distance. Distances between formation resources, teachers and students are always mentioned. But the distances between students are rarely considered. Through the analysis of the distances between students, however, one can elaborate clear analytical categories in order to understand the kinds of involvement into technology that the educational sphere is susceptible to emulate.
Given a clear understanding that most technologies are precisely usable in very varied situations, the following analytical organisation shows that a learning

environment structures a set of constraints which derive from the analysis of the concrete pedagogical situation under scrutiny.

The bottom left quadrant refers to the model of the class. This setting allows for a direct and immediate communication between learners. In most cases such a communication is not an objective pursued by that environment, and learners organise themselves their interactions. Technology in such a frame is mainly focused on the classroom. Educational resources, consulting tools and technological tools of communication are meant for pedagogical activities within the classroom.

The top left quadrant stresses more particularly the use of spaces of resources to which students individually access whenever necessary: information centre, computer laboratory, etc.

The bottom right quadrant suggests modes of learning based on simultaneity in different spaces . For example: individual attendance of a TV program which will be discussed collectively the next day, the audio-, video- and teleconferences allowing for exchange of messages in real time through computers, etc.

The top right quadrant refers to the disappearance of constraints in time and space. Relations between learners are no longer organised by such constraints; space is "open" (this is not an allusion to the anglo-saxon connotation of "open", which alludes either to a free pedagogical style or to the freedom of choice of the learners, as far as contents and domains of formation are concerned). Telephone and computer allow for synchronic and asynchronic interactions between students, who freely deal with them, for learning and non learning purposes.

More about powershifts

OPA methodology is very efficient by considering plenty of other couples of powewrshifts to push decision makers into new situations to explore. Some ideas to combine :

- Teaching vs Learning
- Schools vs Society
- Global vs Local
- Traditional vs New Media
- Individual vs Groups
- Public vs Private
- Central vs Peripheral
- ICT User vs ICT non-User
- Synchronous vs Asynchronous
- Etc, etc

Session 5

NEW PEDAGOGY FOR NEW EDUCATION: PEDAGOGICAL ISSUES

Session 5

New Pedagogy for New Education :

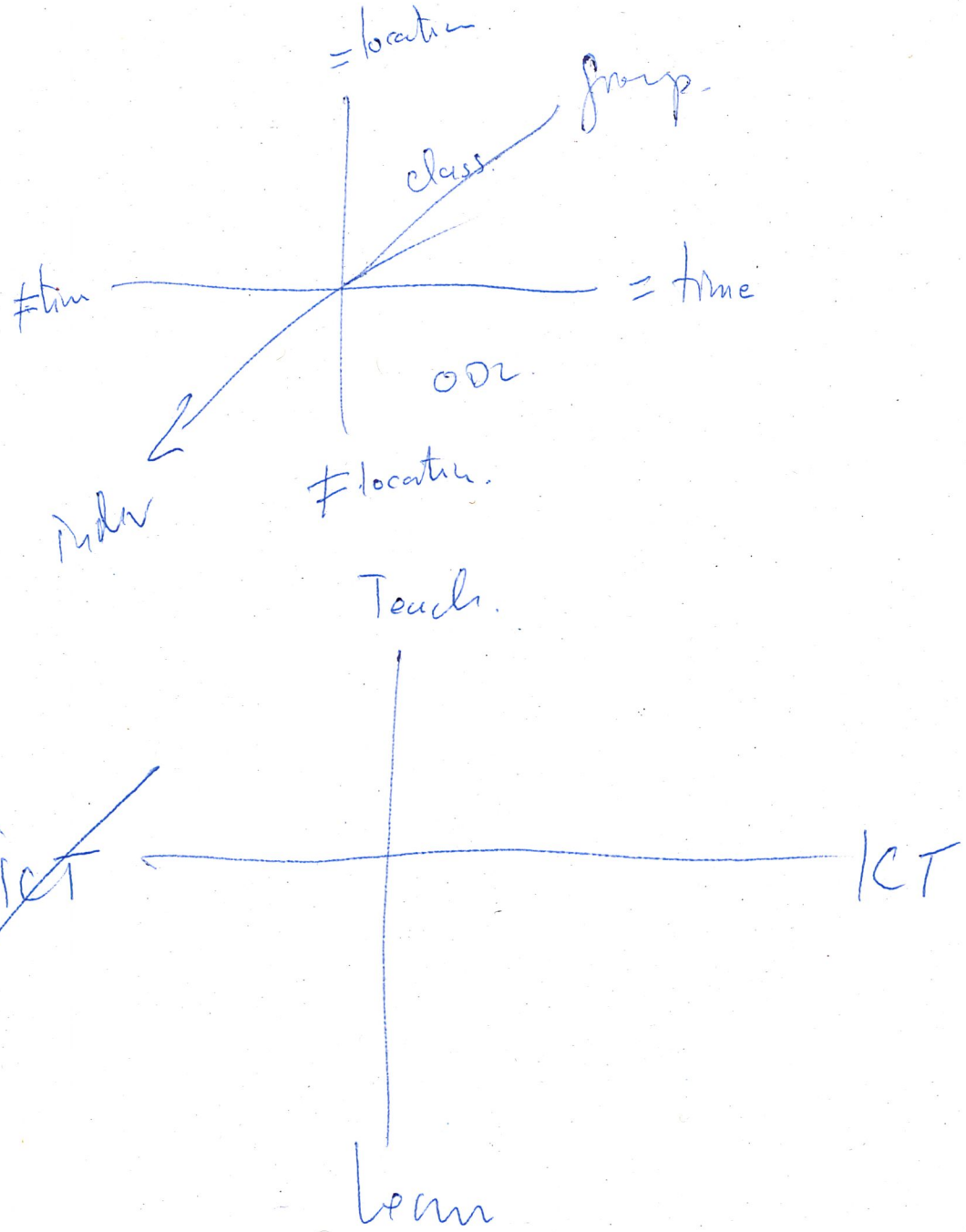
Pedagogical issues

(New paradigms of knowledge and knowledge building, new teaching, new learning, lifelong learning, etc)

Time	45 minutes (Wednesday 18 February, 9:45-10:30)
Objectives	• To illuminate the prevailing pedagogical conditions to be taken into account in design of a policy frame for integrating ICTs into education • To help in drawing guidelines for ensuring the judicious use of ICTs while keeping in view the gender, medium, and curricular considerations • To outline approaches to resolving the dilemmas emanating from the diversities of roles of learners, teachers, assessors, and community • To outline main features of new pedagogy for different types of education, e.g. distance education and Net-education
Content	Educational technology enables the teachers and other educational personnel to handle the complex and repetitive issues of management and teaching tasks. It does so with efficiency. A few have claimed that teachers could better perform their functions provided comprehending the principles of technology and that of pedagogy simultaneously. Further, the knowledge the type of pedagogical scenario that is prevailing in the respective country, will help in designing the policy of ICT integrating into education. • Pedagogical issues to be observed: Special needs; Gender; Language (mother tongue); Curriculum; Literacy (traditional and "new"); Roles of learner, teacher, assessor; Role of community and parents; Lifelong learning New pedagogy for distance and Net-education; Internet pedagogy • Sharing information and experience in the field
Working methods	Plenary session: Presentation and reaction (30 min. = 2 x 15 min) General discussion and feedback (15 min.) Prioritizing the key issues
Moderators	***Chair:*** X Matti ***Main Presenters:*** Raymond Morel and Katja van den Brink ***Reactor:*** Peter Bollerslev

(1) Katja New Learning Strategies → Portofolio

(2) RM. +


=location
group
class
≠time
=time
ODL
≠location
index
Teach.
ICT
ICT
Learn

Expected outcomes	Participants will: • Outline the pedagogical principals suitable for enhancing all types of learning (to learn, to do, to be, and to live) for all types of learners having their special talents and unique handicaps • Be aware of possible changes in the roles of teachers, learners, parents and communities which go along with introduction of ICTs in education • Specify the pedagogical aspects to be taken into consideration while designing action plans on ICT integrating into education.

05-4

UNESCO INSTITUTE
FOR INFORMATION TECHNOLOGIES IN EDUCATION (IITE)

High Level Seminar for Decision-Makers and Policy-Makers
from South Eastern Europe

Towards Policies for Integrating ICTs into Education

16-20 February 2004, Bucharest, Romania

SESSION 5

New Pedagogy for New Education:

Pedagogical Issues

(New paradigms of knowledge and knowledge building,
new teaching, new learning, lifelong learning, etc.)

Presenters: Raymond Morel and Katja van den Brink

- Metaphore of the Chrismas tree
- …remember the 6 OECD scenarios
- In session 6 : « the KEY »
- An Educational Approach to Communication at School : some basic exercices from the MAILBOX project
- ….and about some more « POWERSHIFTS »

« Chrismas tree»

- Static WORLD Dynamic WORLD
- Information static Information dynamic
- Paper Numeric/digital
- Tree structure, Network
- (hierarchy, pyramid)
- Difficulties of cohabitation everyday in all activities of the

6 OECD Scenarios

"status quo »
"Bureaucratic School Systems Continue »:

Strong school systems, resistance to radical change,
Individual classroom and teacher models remain dominant.
Growing use of ICT without changing schools' main organisational structures.
Teachers form a strong corps.
Role and status: continuation of the present situation.
Teaching is considered as an "individual art".

6 OECD Scenarios

"status quo »
"Teacher exodus - The 'meltdown scenario'"

Teaching profession rapidly ageing, less and less attractive.
ICT appear as a possible response to teachers shortage.
Salaries increase in order to attract more teachers,
but it has detrimental consequences for investments
(ICT and physical infrastructure).
A major difficulty in recruiting enough teachers,
the market of "school at home" is developing,
with new types of professionals.

6 OECD Scenarios

"re-schooling"
"Schools as Core Social Centres"

Focus is on socialisation goals and schools in communities.
Schools: the most effective bulwark against social, family and community fragmentation.
Much attention is given to non-cognitive outcomes, values and citizenship.
School facilities open to the community.
ICT are used extensively, especially for communication.
Teachers have a high-level status.
Many other professionals, community players, parents, etc.

6 OECD Scenarios

"re-schooling"
"Schools as Focused Learning Organisations"

A stronger knowledge orientation. ICT extensively used.
Schools look like "learning organisations".
Flourishing research on pedagogy.
Schools management uses teams, networks...
Teachers enjoy favourable conditions and are highly motivated,
R&D, continuous professional development,
group activities, networking (including internationally).
Contractual arrangements might well be diverse,
with mobility in and out of teaching.
"Networked teachers in a networked society".

6 OECD Scenarios

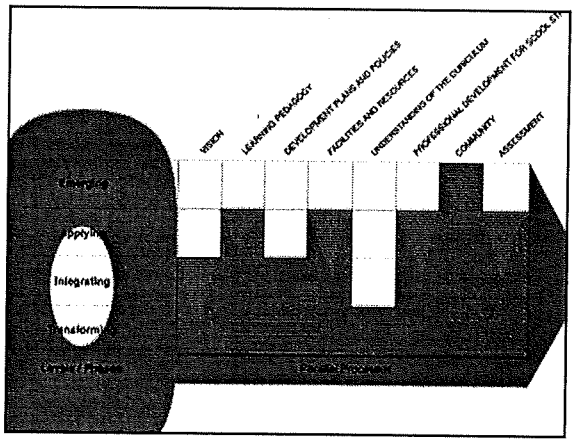
"de-schooling"
"Learning Networks and the Network Society"

New forms of co-operative networks.
Abandonment of schools in favour of learning networks.
The emerging "network society" leads to dismantling of school systems.
Small group, home schooling and individualised arrangements.
Substantial reduction in public facilities for schools.
No longer reliance on "teachers". New learning professionals emerge, consultants (home teaching, educational "hot lines", office consultancy...).

6 OECD Scenarios

"de-schooling"
"Extending the Market Model"

Existing market features in education are extended; governments encourage diversification.
New providers stimulated to come into the learning market.
The most valued learning determined by choices and demands.
There is a substantially reduced role for public education authorities
Entrepreneurial management modes are more prominent.
New learning and educational professions are created in the market.



An Educational Approach to Communication at School

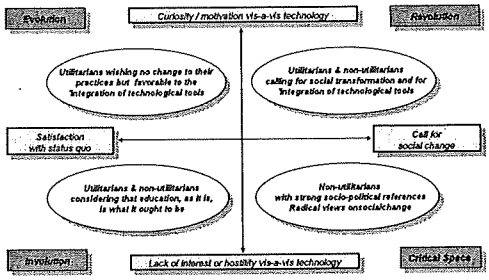
MAILBOX, a project of the SOCRATES-EOD Programme 1996-1998
DG 22 of the European Commission

Focus points

- Ideology
- Specificity
- Models
- Uses of communication
- Engineering
- Professionality

IDEOLOGY

How to position oneself?



SPECIFICITY

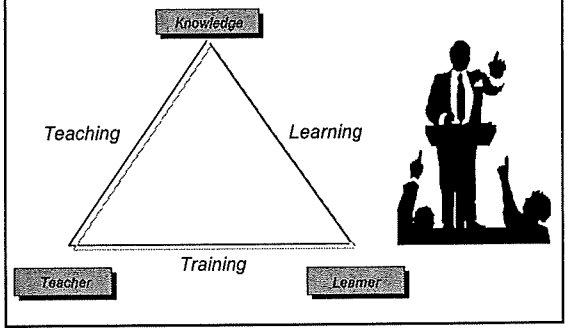
Three essential characteristics

- Dictation
- Culture
- Service

MODELS

The reference Model:

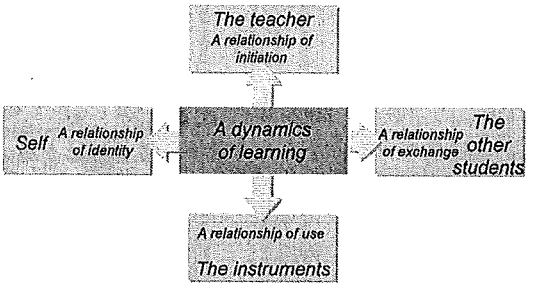
The pedagogical triangle



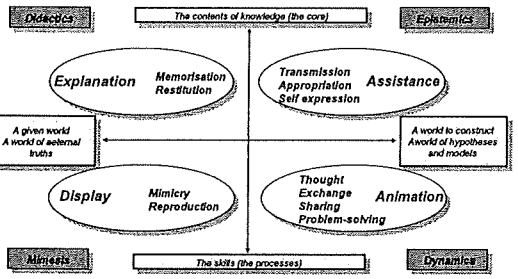
The status of knowledge has changed

- From the given (fact) to the constructed (fact)
- From the Truth to the negotiated representation
- From individual appropriation to collective intelligence

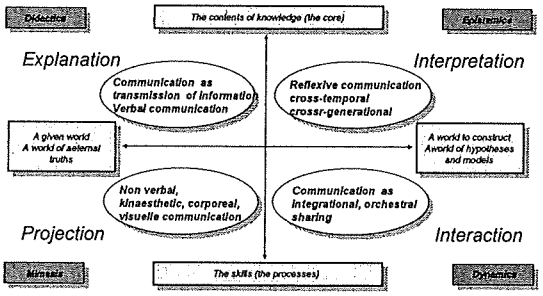
Model transformation: Learning…



and teaching... beyond teaching



Communication at school: a four-stranded braid

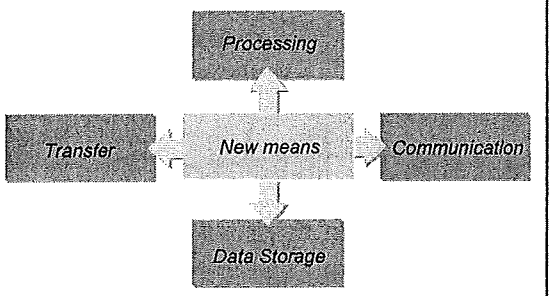


Uses of communication

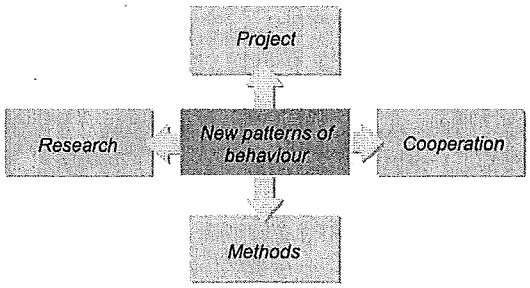
4 uses of reference

- Electronic mail
- Searching information on the Internet
- Computer conferencing (IRC)
- Video-conference

Resources



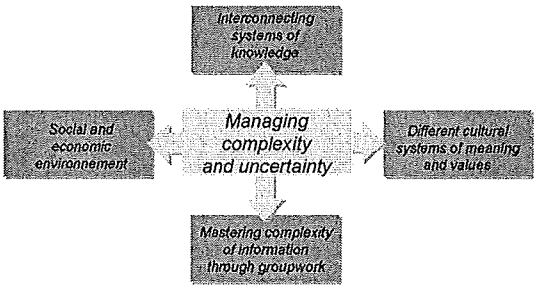
Modes



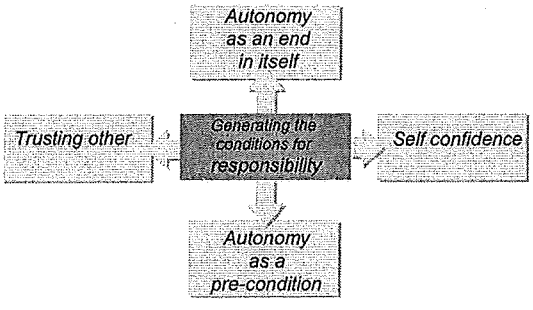
5 major arguments

- Complexity & uncertainty
- Autonomy & trust
- Values of imagination
- Conventions
- Power relations

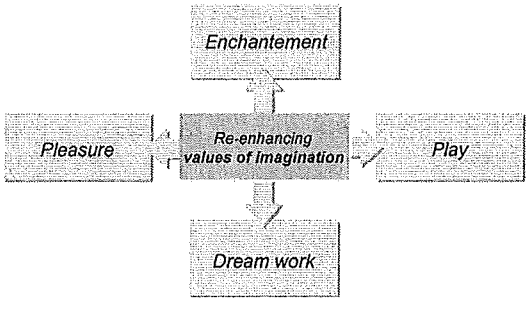
Complexity & uncertainty



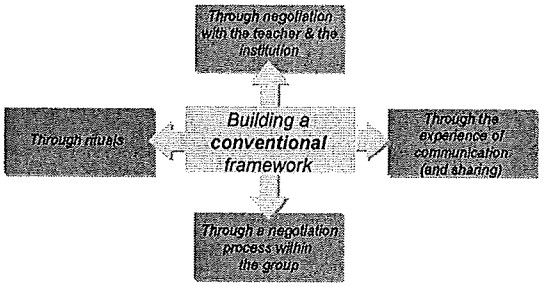
Autonomy & trust



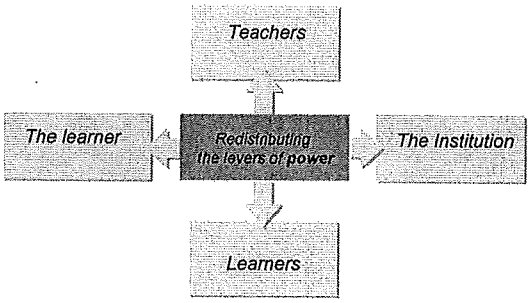
Values of imagination



Conventions

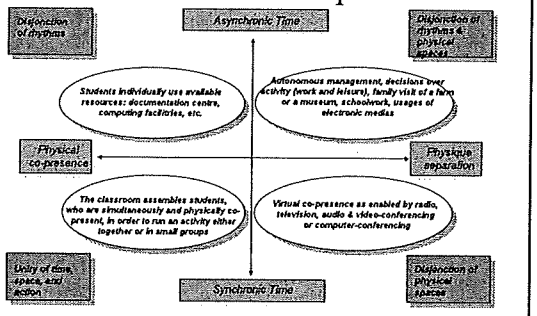


Power



ENGINEERING

Reconsidering the topography of the educational space



Key dimensions

- Organisation
- Pedagogy
- Technology
- Economics

PROFESSIONALITY

The future (already present) of a job

- Managing complexity
- Managing individuals and groups
- Managing resources

some more « POWERSHIFTS »

- Teaching vs Learning
- Schools vs Society
- Global vs Local
- Traditional vs New Media
- Individual vs Groups
- Public vs Private
- Central vs Peripheral
- Etc, etc…..

Deep Self-regulated Learning with ICT: Prerequisites for its Implementation in Education.

Katja van den Brink

New teaching & learning Perspectives

- Self-Regulated Learning
- Approaches to Learning

Self-Regulated learning with ICT: The learner is able to

- Determine his/her learning needs & goals
- Identify resources (books, people, ICT etc.)
- Chose & use adequate learning strategies
- Monitor the learning process
- Evaluate the learning state/results
- Process starts again …

Deep learning with ICT: The learner is

- Intrinsically motivated: enjoys & continues learning, curious & interested in content
- Independent of external rewards
- Personal commitment to the ongoing learning process
- Employs specific cognitive & meta-cognitive strategies

ICT: POTENTIAL for supporting a deep & self-regulated learning

- Interactivity/Simulations
- Feedback function
- Complex interrelations
- Independency of time & locality
- Individualising learning is possible: Own pace/level of difficulty

How to combine deep-self-regulated learning with Characteristics of ICT?

- Teachers & students need to learn about learning concepts (motivation, strategies, meta-cognition etc.)
- Student-centred & student- activating method of teaching & learning
- Adaptation of ICT learning material to these concepts
- Evaluation of learning performance

E-Portfolio Assessment

- Qualitative Assessment of students` performance
- Collection of students` work concerning a given learning task/goal: assignments, written works, photos, drawings, multimedia, feedback, log book

E-Portfolio Objectives

- Dealing with the new technology: how to produce multimedia (with Word processor, Powerpoint, Photoshop, flash, dreamweaver, illustrator)
- Within a given context (academic authentic task)

E-Portfolio Example

http://elwa.ilu.uu.se/IKTiS02/maria/door.htm

Advantages 1

- Provide insights into learning processes and related changes
- Emphasis is on change or growth in the process at multiple points in time
- Tool to foster commnication and accountability to teachers and other students
- It allows to see the students as individuals – each portfolio is unique

Advantages 2

- It provides a basis for future analysis and planning
- It promotes a shift in ownership
- It promotes collaborative work
- It offers a more complex evaluation
- It covers a broad scope of knowledge and information from many different sources

Disadvantages

- Less reliable or fair than qualtitative ev.
- Very time consuming for teachers
- Development of criteria can be dfficult
- Unclear goals and criteria can lead to an unorganised collection
- Difficult to analyse the data

Political Consequences 1

- High-level profound & ongoing teacher & learner education with pedagogical concepts implementation
- Policy measures should focus more on broad concepts of pedagogical measurements instead of narrow focus on hard- and software (teacher education, Action research, competencies of teachers etc.)

Political Consequences 2

- H&S equipment as well at primary as on secondary level
- Systematic & scientifically based evaluation & development of ICT application & the use in the classroom for preventing a surface/passive approach to learning

Political Consequences 3

- Focusing on the broad potential of ICT: research results
- Adaptation of ICT learning material & evaluation instruments to these concepts

Political Consequences 4

- Provide compatible soft/hardware (also by fundraising?)
- School curriculum: less is more - focus on interdisciplinary learning; within the subjects: focus more on knowledge construction of concepts and learning strategies than on facts and numbers

Session 6

NEW PEDAGOGY FOR NEW EDUCATION: TEACHERS, THE TEACHING PROFESSION, TEACHER TRAINING AND EDUCATION

Session 6

New Pedagogy for New Education :

Teachers, the Teaching Profession, Teacher Training and Education

Time	90 minutes (Wednesday 18 February, 11:00-12:30)
Objective	The role of Teachers is crucial in Education integrating ICTs, and therefore educational policies must pay special attention to Teachers and Teacher training. The objective of this session is to provide input about teachers, the teaching profession, and teacher training, for the design of educational policies
Content	The session will include: cool down. 1. A short «warm up discussion» with participants, in order to formulate their main expectations towards teachers, their conception of the teacher's role, their main difficulties and bottlenecks regarding teachers, their ideas for teacher training, and their view of the place of the question of teachers in an educational policy. 2. Short presentations (4 times 15 minutes) by experts: Possible issues to be addressed: - Evolutions in the teaching profession: the new aspects of the role of teachers in an ICT-integrated-Education. - Teachers and Society; New expectations of Society towards teachers. - New tools and resources for teachers, new possibilities for pedagogy, new work environments for teachers. - Teacher training (in-service, pre-service): which aims? Which contents? Which methods? - etc. 3. Comments by the Reactor and a short final discussion.
Working methods	• This session is part of the set of sessions about «New Pedagogy for New Education». The working method should be linked with the method for all these sessions. • Warm-up discussion, during which each participant will be asked to produce some ideas, comments, statements, about the teaching profession, about teachers and their role, about teacher training. • Short presentations by experts, focussing on precise topics. • Discussion and Reaction. Plenary session: Presentation and reaction (60 min.= 4 x 15 min.) General discussion (15 min.) – feedback (15 min.) Prioritizing the key issues

Math.
reactor

Moderators	***Chair:*** X Mike ***Main Presenters:*** Katja van den Brink, Peter Bollerslev, Bernard Cornu and Raymond Morel ***Reactor:*** Y Matti
Expected outcomes	The session aims at providing the participants with: • a better awareness of the new expectations of Society towards Teachers, • a better awareness of the new dimensions in the Teaching Profession, • a better understanding of the place of the Teacher in an Educational Policy, • some principles and recommendations for Teacher Training.

1. BC The Teaching profession.
2. PB Reflections on TE
3. KvdB Multimedia and TE
4. RM → ? ~~10 contentions~~ Keys. / 10 contentions

Cool down 15'

Reactor 15 Matti