LEARNING IN THE 21ST CENTURY

A Case Study of the Arthur Andersen Community Learning Centre in Alameda

Briefing paper for video presentation

Moving into the 21st Century will create change and challenge thereby paving the way for a new age of learning. This paper presents a case study of the development of the Arthur Andersen Community Learning Centre in Alameda California. It sets out the approach taken to create the vision for the centre in partnership with Arthur Andersen and the development of an innovatory learning environment within the traditional school system.

The centre has demonstrated the value of redesigning the learning process to create a technologically rich environment. The technology is seen as an enabler to enhance the learning of the student as well as establishing the culture of a learning organisation.

Arthur Andersen's role

As a global multi disciplinary professional services organisation Arthur Andersen has a tradition of involvement in education. It believes that: tomorrow's education system must equip students to be self-motivated and self-directed learners, problem solvers, critical thinkers and systems thinkers who are competent in languages and technology.

To meet these ends requires the involvement of educationalists and business, both of whom have a role to play in developing policy. While the former acquire a better understanding of the needs of employers, those in commerce need to be aware of, and involved in what is taking place in schools.

Arthur Andersen believe that business can only apply its knowledge effectively to the education system when it understands the learning process. These words are backed up by resources: the firm's emphasis on training and education (around 8% of net revenues) is widely recognised by other companies and acknowledged as a major plus by existing employees and potential employees alike.

Over the last ten years, Arthur Andersen has taken the initiative and has sponsored a pilot programme in the US regarding the form and conduct of a School of the Future.

This involved designing new organising principles for schools and developing learning systems based on self-directed learning. This evolved around a philosophy where there was no such thing as failure and that learning was a life-long experience. This work was based upon extensive research on Global Best Practices in education and was influenced by Arthur Andersen own commitment and development as a learning organisation.

A partnership for change

Arthur Andersen began working with the Alameda Unified School District in 1990 to create the vision of a school of the future. Arthur Andersen in consultation with the district developed a programme to engage all of the stakeholders in the local community in this debate and to produce a 'graduate profile' which defined the skills they believed were needed for the 21st Century. Arthur Andersen facilitated extensive visioning workshops and as well as the stakeholders identifying the need for new skills there was growing recognition that the learner needed to be fully engaged in managing their learning. The concept of the autonomous learner became a central part of the debate and the importance of developing thinking skills as central to new learning was established.

The vision

As a result of extensive discussions a vision of a school of the future was created.

Vision of School of the Future:

- Where every student succeeds
- Where parents commit to students and teachers
- Where every student can read, write and use IT
- Where school is fun and relevant
- Where employees value the graduates and operators of our schools
- Where graduates have the lifeskills needed to operate effectively – no matter what challenges our fast changing world may throw at them

The visioning process had also demonstrated that learning would need to be at the centre of community activity and that a learning community needed to be established.

Vision of the School in the Community:

- To be at the centre of the community
- To build relationships with communities of learners which are:
  - World-wide
  - Collaborative
  - Co-operative, not competitive
  - A network of resources and learning, resources and experience

- To ensure parents and community are:
  - Actively involved
  - Contributors to the visioning and the programme

- To develop collaborative relationships between:
  - Industry, business professionals, teachers and students

A new curriculum model was determined and general to this approach was the importance of the learner contributing to the welfare of the wider community and working in a more collaborative way.

Curriculum:

- Individual and self paced
- Open ended
- Constantly evolving
- Global orientation
- Common core
- Real life
- High and Low tech
- Developing life-long learning practices

A model of transition

Traditional Education System	Creative Learning Systems
• Institutional instruction	• Collaborative working learning
Educators/trainers determine:	Working/learning teams, assisted by learning facilitators, determine:
• Knowledge to be acquired • Skills to be mastered • Schedule, location and quality of participants experiences • Resources to be utilised • Assignments to be completed • Criteria for assessment • Methods of evaluation	• Knowledge to be acquired • Skills to be mastered • Schedule, location and quality of participants experiences • Resources to be utilised • Assignments to be completed • Criteria for assessment • Methods of evaluation
Social status is derived from:	Social status is derived from:
• Credentials (qualifications, certificates etc.) • Title and rank • Institutional affiliation	• Contributions to team accomplishments • Contributions to community welfare • Approach to stewardships
Pre-established scope and sequence of curriculum content is 'covered'	Curriculum content is 'uncovered' and organised in real time by
• By teachers through planned courses of study	• Learners engaged in personally meaningful and socially beneficial endeavours
• Activities in time and space are fragmented into studies organised by academic disciplines	• Transdisciplinary practices integrate learning with life and relevance for the learners
• Knowledge is a legacy preserved and passed on by those with the appropriate academic credentials	• Knowledge is constructed by learners from their experiences, through dialogue in working/learning communities
• Students are treated as workpieces to be shaped by the system	• Worker/learners co-evolve, contributing to as well as benefiting from the system
• Students are finely sorted and assembled by their ages	• People of different ages and even of different generations can learn together
• Content is covered 'just in case' it might one day be useful to the student	• Content is uncovered 'just in time' to be useful to the 'worker/learner'
• Most learning takes place prior to maturity, when the learning of early years is finally applied	• Learning is a lifelong process, with learning applied to complex project work done by people of all ages
• Electronic technologies are adopted slowly; and used primarily as aids to teaching and educational administration	• Electronic technologies are provided over networks directly to learners to be used as on-demand information utilities, application tools and performance support systems
• Governance is hierarchical, bureaucratic, rule-based and punitive	• Governance is participatory, agile, principle-based and humane
• Teaching and learning resources are replenished or augmented periodically	• The on-line database Creative Learning Support System™ and the Creative Learner Facilitator Support System™ are continuously updated
• Educators from different locales are interconnected primarily through national and regional professional, associations	• Worker/learning collaborators from different locales are globally interconnected through electronic networks aided by Creative Learning Web Workers
• Large scale units of schooling are labour-intensive, with multiple levels of human administration, limited resource utilisation and low productivity	• Small-scale Creative Learning Plaza™ environments are capital-intensive, with flat distributed administration, extensive resource utilisation and high productivity

Adapted from *What Makes a Difference* (Creative Learning Systems, Inc) by Collarbone and White

The vision for the School of the Future centred on the school as a learning community. The work of Peter Senge, Director for the Center of Organisational Learning at the Massachusetts Institute of Technology featured strongly in the evolution of the new learning environment. A collective view developed that schools needed to develop a broader set of "basics" which would include the ability to engage in systems thinking, to initiate technology in learning, to work co-operatively in high performing teams and actively to acquire new skills.

Arthur Andersen commissioned Creating Learning Systems Inc, who believed that traditional concepts of classroom design and learning methodology needed to change with the use of ICT to create the learning environment of the future.

Using the Senge model as a basis Creative Learning Systems created the concept of a creative learning plaza that became the learning environment for the Arthur Andersen Community Learning Centre in Alameda.

The Creative Learning Systems model is rich in technology including:

- One computer between four students
- Programmes for word processing, information access across the curriculum, data analysis
- Internet and intranet connections
- Specialist technological apparatus for robotics, science and media
- Collaborative coves – small rooms with 3-4 computers networked to a simple large screen for joint writing, planning, evaluation and collaborative writing

Arthur Andersen Community Learning Centre

The centre opened in 1996 on the site of the Encenal High School in Alameda.

The key features were:

- one room scheduling
- 150 students
- multi-age (12-18 yrs), multi-disciplinary learning
- self-directed learning
- teachers as facilitators
- technology in support

The school is rich in information technology. Students have easy access to many sources of information, using databases, word processing, the Internet, video and video conferencing. Facilitators can also use the technology to instruct small or large groups, design programmes for individual learning, or for staff development. ICT is used to assess individual students' work and to design future learning programmes.

The school demonstrates new approaches to learning based upon an ICT rich environment. The significance of this school lies with the multi disciplinary and integrated approaches that are being used to meet new learning needs. In addition self paced and self directed learning across age is raising achievement across all of the areas of the curriculum for the students compared with their peers in other Alameda schools.

The school has placed great emphasis on the empowerment and engagement of all of the students within the centre and has achieved a more self-managing approach to learning. The centre has developed high levels of student participation across all aspects of organisation and learning.

The learning environment has a number of fixed points that are fed by services and which can have three working stations built around each. All units interconnect so that construction of the work environment can be made to suit the group of learners. Partially completed work can be removed on detachable worktops and stored.

The key features of the environment are:

- the space can accommodate up to 150 students and staffed by 5 facilitators
- one space of about 7,000 to 10,000 sq ft was used for all activities in the centre. Some option groups and PE took place in more traditional areas
- individual work programmes are negotiated between teacher and facilitator, and student/learner
- mixed ages and genders – students worked at their pace
- wide range of technologies available, including CNC, data capture, multimedia, video and film making and digital studio
- each area had a collaboration cove – 3 computers linked to each other and to a large screen to facilitate team working

Organisation

The centre can accommodate 150 students who are supported by five facilitators. The facilitators work as a core team with one facilitator taking a co-ordination role across the team.

There is a training and induction programme for those wanting to become facilitators which has been extensively developed. Teachers were invited to apply for posts when the centre opened with great emphasis on selection placed on good classroom practitioners.

The facilitators need to be committed to independent learning methods and to see their role as that of lead learners, coaching and mentoring the student. The need to develop skills to work in a multi-disciplinary environment and feel comfortable using a range of multi media resources. Specialist on call back up is provided for the ICT system within the centre. Initially the facilitators were subject specialists but as the school has evolved facilitators found through the new approaches and the quality of the ICT provision that they could teach across the range of subjects covered within the curriculum of the centre.

The facilitators and learners share the work surrounding the organisation of the centre. They act as stewards and carry out a range of tasks helping to support staff in the traditional school. A high degree of social awareness is demonstrated by the learners in the centre. A judicial system has been developed which applies to all those within the learning community. The ethos that has been created is one that has engaged the learners is active participation in their own learning and has equipped them with new and more relevant skills for the 21st Century.

The environment that has been created motivates the learners and they appear confident and articulate. The results that are being produced place the students ahead of their peers in the Alameda District. The flexibility of the environment allows the learners to learn independently and have regard to their

preferred learning style. The social dynamics created around learning activities stimulates team and group work.

Applications

The Arthur Andersen Community Learning Centre has developed the latest technology to stimulate and enhance learning. The access to such technology in a new learning environment radically alters students perceptions of themselves and their capabilities. The technology is not only enhancing learning and learning styles but is helping to place the learner in charge of their own learning. This does create the capacity for students to learn at their own pace and in their own time and begins to break down the barriers of age and stage in learning and allows adults and younger students to learn together and to help each other learn.

The role of the facilitator is central to this. The technology has helped the facilitator feel confident in developing a more generalist approach to life skill development whilst being able to support students in complex and high level projects to meet Californian assessment standards

There is great potential here for such centres as the Arthur Andersen Community Learning Centre to be used to improve access and opportunity for all to learn within the community.

Development in City and Community Learning Centres are taking place throughout the UK and we have been applying many of these principles and approaches to their design and implementation.

Throughout all of this we are clear that there are great benefits to be gained in education and business working together in partnership to create new learning environments to open up greater access to learning to all those in the community.

The issues of leadership and creating a culture where staff, students and the community have an eagerness and willingness to embrace change should not be underestimated. There are resource implications in the creation of new learning environment but equally important are the change enablement strategies that need to be developed to implement such programmes.

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WC2006

Le Monde DE L'ÉDUCATION

DE LA CULTURE ET DE LA FORMATION

HORS-SÉRIE - SEPTEMBRE 1998

Apprendre à distance

sous la direction de :

Michel Serres

et

Michel Authier

■ **LES SERVICES**
■ **LES HOMMES**
■ **LES NOUVELLES INFRASTRUCTURES DE LA CONNAISSANCE**

par Jean-Michel Djian

La classe n'est plus le lieu incontournable à partir duquel le savoir est transmis. Par un paradoxe supplémentaire dont notre siècle finissant a le secret, plus la nécessité de construire des établissements d'enseignement et d'accueillir en masse élèves ou étudiants se fait grande, plus les possibilités d'acquérir des connaissances autrement que dans les espaces prévus à cet effet s'amplifient. Apprendre à distance n'est plus seulement un moyen de se former, mais une autre manière de cultiver son temps, de se réapproprier l'espace et d'accéder par des voies nouvelles aux sources du savoir. De l'échange, on ripe progressivement au partage. Et celui ou celle qui désire apprendre sait désormais qu'il ne lui suffit pas de consommer de la connaissance pour être meilleur. Il doit inventer simultanément une façon d'être et d'agir sur elle.

Tout un monde est, pacifiquement, en train de basculer, alors que perdurent des modèles éducatifs qui, loin d'être rejetés, sont au contraire encouragés. On assiste à la cohabitation obligée entre, d'une part, des apprenants de plus en plus nombreux pour qui les technologies de l'information et de la communication sont un outil intégré dans leur cursus personnel et professionnel, et d'autre part, toute une population silencieuse qui, du chômeur en fin de droits au ministre de la République, n'a toujours pas la moindre idée des vertus comme des vices de cette révolution éducative. Jamais il n'a été techniquement si simple d'accéder aux savoirs, mais jamais il n'a été, en revanche, si difficile de s'en approprier culturellement la maîtrise. Faut-il, pour autant, continuer à creuser le fossé ? L'accélération des mutations qui se préparent dans la manière de travailler, de produire et de vivre au siècle prochain est déja suffisamment éloquente pour ne pas ajouter à cette inégalité une injustice de plus : celle de remettre définitivement en cause l'accès de chacun à l'éducation et, dans la foulée, de passer à côté de l'édification d'une société de l'information qui soit à son service. ■

« Toute une population silencieuse qui, du chômeur en fin de droits au ministre de la République, n'a toujours pas la moindre idée des vertus comme des vices de cette révolution éducative »

SOMMAIRE hors-série - Septembre 1998

Rapho

■ D'hier à aujourd'hui
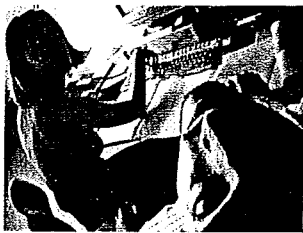
Edeliong

■ De la théorie à la pratique

Photonica.

■ Inventer le futur

Towards DLE's

Paul Jansen, SLO

Petra Fisser, Utwente

Cees Terlouw, Utwente

the Netherlands

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V 6.2.7

Presentation

- **Secondary general education**

- **Implementation**

- **Situation**

- **Models**

- **Example**

The Netherlands

- 15.860.063, 34.329 km^2, 462/km^2

- Primary: 1.533.928p, 7238s

- Secondary: 855.835p, 666s

- Average income: ƒ 50.000/32.000

- Lack of teachers

Curriculum

- National
- Tight
- Detailed
- Subject-defined
- Knowledge driven
- Overloaded

- 5 year cycle
- Polder-model

Didactical buzzwords

- New learning

- Constructivism

- Scaffolding

- Student centered

- Learning to learn

- Productive learning

- Lifelong learning

ICT & Education

- **Hardware**
  - School 1:10
  - Home >70%
- **Kennisnet**
- **Teacher training DRO**
- **Projects**

Now we have the hardware, the software and internet,

What to do?

Kennisnet

- Fast

- Schools, Libraries, Museums

- Digital assessment DRO

- Metadata project:

  - Thessaurus / subject

  - Evaluated URL's

The Learning Environment

Innovation

Substitution

↓

Transition

↓

Transformation

29

Heading to

Interaction model

Categories ICT

- **A Communication**

  - E-mail, chat, discussion groups, videoconferencing

- **B Working on tasks**

  - Application, CAT, simulations, groupware, portfolio

- **C Information**

  - Databases, WWW, sources, publishing

- **D Administration & organisation**

- **E Curriculum changes**

Framework for ICT, student

ICT-Interaction ➔ ⬇ Educational functions	Learner / Teacher	Learner / Collegues	Learner / Sources	Learner / Products	Learner / External	Learner / Organisation	Yes/No
Preparing							
Insight in learning goals							
motivate							
Existing knowledge							
Planning							
Executing							
Oriëntation on elements of knowledge							
Oriëntation on skills and attitudes							
Exercise							
Regulating							
supervise / monitoring execution and power							
Feedback during / after practise							
Testing / Assesment							
Feedback after test							
Creating conditions							
Facilities							
Teacher oriented aspects							
Yes / No							

Selling to the teachers

- **Attractive to learners**
- **Fits in the existing curriculum and the daily didactics and organisation**
- **Easy to do, no technical problems**

The EES project

- Geography, research in own region, publish on Internet
- All 3d classes of all sec. schools in Enschede

EES software

- **Production**
  - Sources, formats, help, questions, thessaurus
- **Publication**
  - Site, search functions
- **Upload facility**

EES organisation

- School
- Sources, copyrights
- Experts
- Responsability & Insurance
- Teacher instruction
- Following years

EES benefits

- Growing database of information for pupils, family, bussines
- Stimulation of integration of subjects
- Next step renewal

The future starts now
The future is uncertain

Columbus

management

The goal

is the

...ey itself

WC2000

Return-on-Investment and On-line Learning

Jef Moonen

Faculty of Educational Science and Technology
University of Twente   The Netherlands

10 Abril, 2000 — Chile 2000, IFIP WG3.1 Working Conference — 1

Why On-Line Learning?

- Vision and potential: technology push
- Best of two worlds: interactive, direct feedback versus flexibility, efficiency

10 Abril, 2000 — Chile 2000, IFIP WG3.1 Working Conference — 2

Three arguments

- Need student enrollment (economic argument)
- Improve quality
- Improve efficiency

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10 Abril, 2000 — Chile 2000, IFIP WG3.1 Working Conference — 4
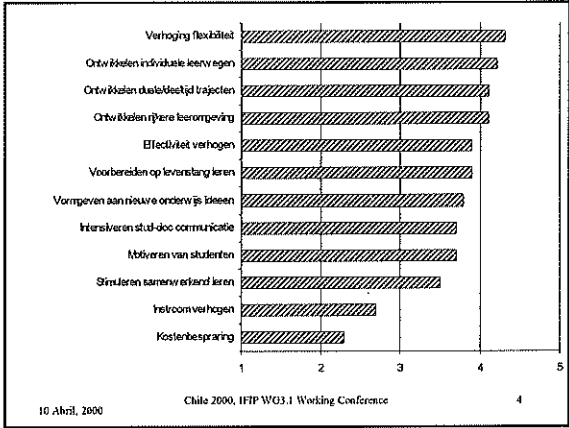
Potential versus Reality

- Differences in opinion:
  - starters versus more experienced providers
  - starters: emphasis on potential
  - experienced providers: emphasis on reality

10 Abril, 2000 — Chile 2000, IFIP WG3.1 Working Conference — 5

Return on Investment

- An idea whose time has come (again)?
- Common practice in corporate sector
- Growing interest in training and education sector because of need for accountability
- ROI = (net program benefits/program costs) x 100

10 Abril, 2000 — Chile 2000, IFIP WG3.1 Working Conference — 6

ROI process model
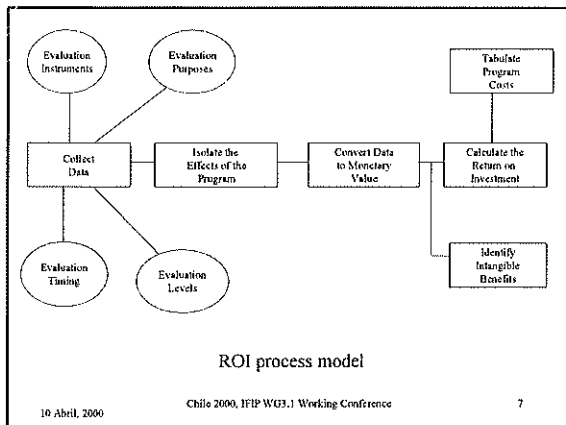
What about costs (1)?

- Long lists of cost items; many ways to categorize costs
- Problem: how to collect reliable data?
- Direct recurrent costs (in relation to the integration of ICT in education):
  - extra personnel (maintenance and support)
  - depreciation of hard- and software
  - space-classrooms
  - production, distribution of learning material

What about costs (2)?

- There are many intangible or non-monetary costs, such as:
  - training for staff
  - time spend by instructors/students for which they are not paid for
  - frustation as a result of misfunctioning of the technology and the time to fix it
  - what about cost for NOT doing it?

What about benefits (1)?

- Kind of benefits:
  - performance, attitude, motivation, dropout rate, throughput time, professional career, ...
- Intangible benefits:
  - flexibility, time-place independence, communication facilities, marketing value, ...

Benefits (2)

- Effects of using media/ICT in education:
  - not very impressive on performance
  - positive on motivation, time-on-task, throughput time

Simplified ROI

- A complete ROI calculation is difficult and complex: therefore simplify process
- Make distinction between aspects that can be measured in monetary terms and other aspects
- Concentrate on those aspects that make a difference (in the traditional versus the ICT-based situation)

Strategy

- **In order to improve the ROI when introducing ICT in education:**
  - Assume (at least) equal tangible benefits
  - Emphasize intangible benefits
  - Be aware of extra operational costs:
    - extra personnel, hard- and software depreciation, time investment of instructors and students, extra space, production of learning material; try to reduce those costs

On-line Course

- Starting by the end of April, an on-line course on 'Costs and Effectiveness in Education and Training' will be offered by the Faculty of Educational Science and Technology of the University of Twente.
- Duration: 8 weeks
- Objective: studying background literature, and application of simplified ROI approach to familiar situation in own institute
- Participation as observer-no feedback (also experiencing TeleTOP approach): send e-mail address to: Moonen@edte.utwente.nl

National

Educationa

Technology

Standards for Students

The National Educational Technology Standards (NETS) Proj
is an ISTE initiative the National Aeronautics and
Space Administration in consultation with the U.S.
the Milken Exchange on Education
Technology; and Appl Computer, Inc.

Our Educational System
Must Produce
Technology
Capable Kids

To live, learn, and work successfully in an increasingly complex and information-rich society, students must use technology effectively. Within a sound educational setting, technology can enable students to become:

▶ *Capable information technology users*

▶ *Information seekers, analyzers, and evaluators*

▶ *Problem solvers and decision-makers*

▶ *Creative and effective users of productivity tools*

▶ *Communicators, collaborators, publishers, and producers*

▶ *Informed, responsible, and contributing citizens*

All Kids Must Be
Ready for a
Different World

Parents want it!

Parents want their children to graduate with skills that prepare them to either get a job in today's marketplace or advance to higher levels of education and training.

"In poll after poll, parents say technology is essential to a child's education." (Technology Counts: Taking Technology's Measure, *Education Week,* November 10, 1997)

Employers want it!

Employers want to hire employees who are honest, reliable, literate, and able to reason, communicate, make decisions, and learn.

"To thrive in today's world and tomorrow's workplace, American students must learn how to learn, learn how to think, and have a solid understanding of how technology works and what it can do." (CEO Forum, *School Technology and Readiness Report,* 1997)

Communities want it!

Communities want schools to prepare their children to become good citizens and productive members of society in an increasingly technological and information-based world.

"The community knows that we know computers, we have the skills, and we can use them. Our community realizes that we're the future, we're the growth of this world, and we're the growth of this community." (Greenbriar, Arkansas student, Elizabeth Rhodes, whose technology project, remapping school bus routes, was implemented in her community.)

The nation wants it!

National leaders, the U.S. Department of Education, and other federal agencies recognize the essential role of technology in 21st century education.

"President Clinton, Vice President Al Gore, and a procession of state governors from both political parties have recently endorsed technology as a necessary tool for education. At last year's national education summit in Palisades, N.Y., the governors and business leaders who attended made improving education technology one of two main goals for school change." (Technology Counts: Taking Technology's Measure, *Education Week,* November 10, 1997)

AND MOST OF ALL... KIDS NEED IT!!!
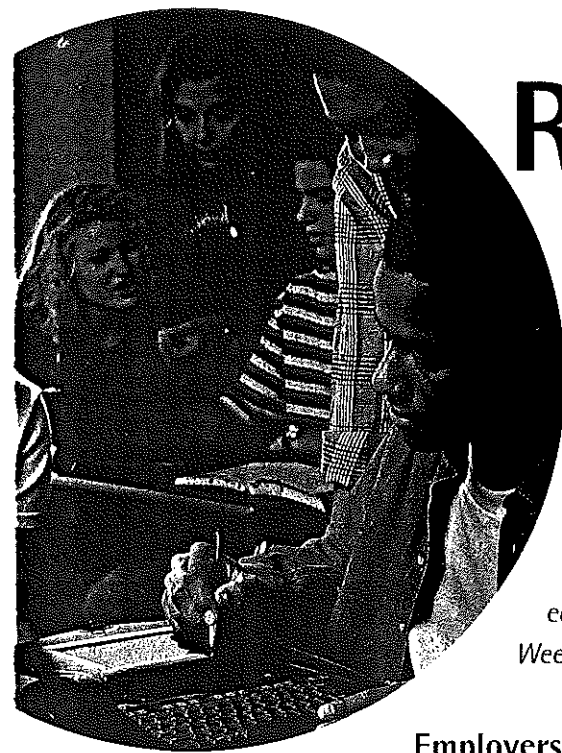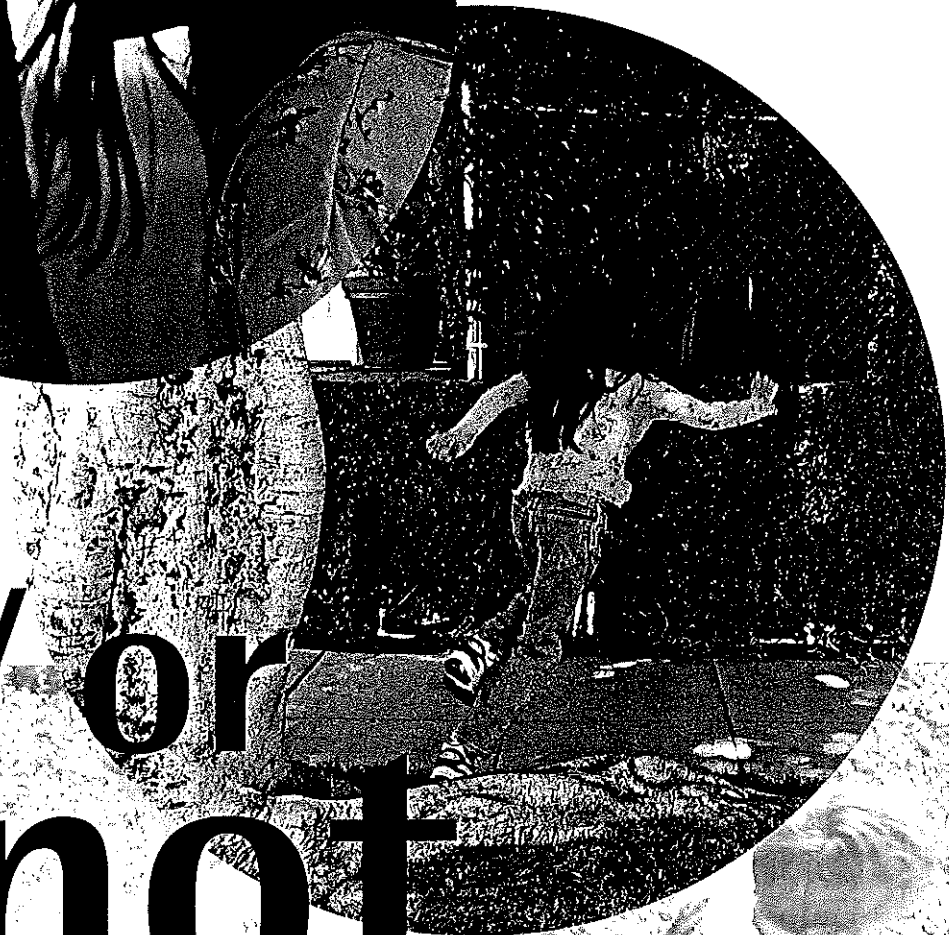
Ready or not...

Tools are different...

The World Is
Different

Communication
is different...

Work is different...

And
earning Is
Different

Kids are different...

Information is different...
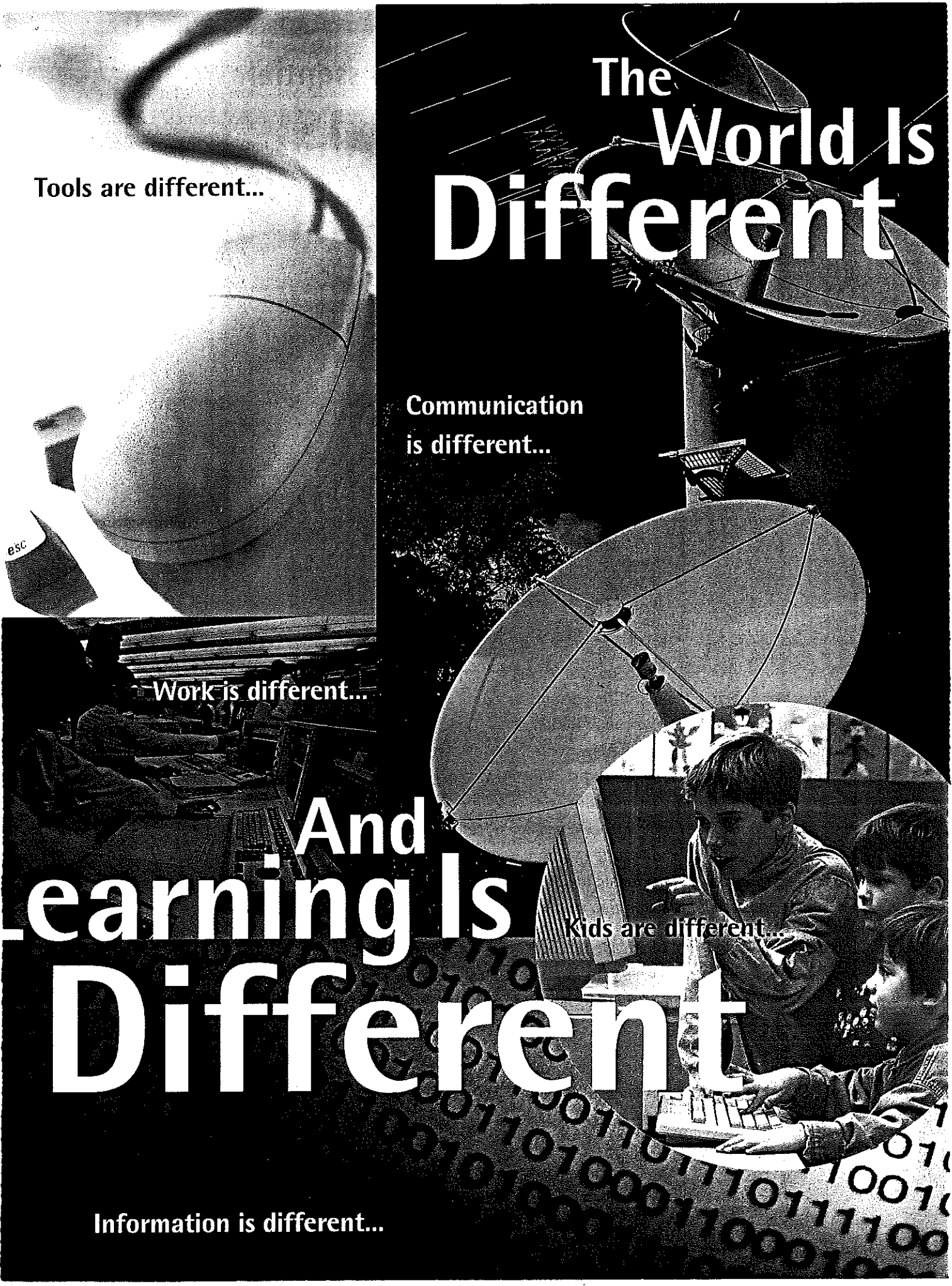
Essential
Conditions
to Make It Happen

Students in a Chicago elementary school recently used technology to explore the history of Ice Age animals in Illinois. Using the Internet, they "traveled" to the Illinois State Museum (200 miles away) and to the Brookfield Zoo (10 miles away) to gather information and talk with experts via two-way video. Then they constructed an electronic database to organize and analyze their data and shared their findings with other students outside their own school in multimedia reports posted on a Web site titled "Mastadons in Our Own Back Yard."

Successful learning activities such as this depend on more than just the technology. Certain conditions are necessary for schools to effectively use technology for learning, teaching, and educational management. Physical, human, financial, and policy decisions greatly affect the success of technology use in schools.

A combination of essential conditions are required to create learning environments conducive to powerful uses of technology, including:

▶ *Vision with support and proactive leadership from the education system*
▶ *Educators skilled in the use of technology for learning*
▶ *Content standards and curriculum resources*
▶ *Student-centered approaches to learning*
▶ *Assessment of the effectiveness of technology for learning*
▶ *Access to contemporary technologies, software, and telecommunications networks*
▶ *Technical assistance for maintaining and using technology resources*
▶ *Community partners who provide expertise, support, and real-life interactions*
▶ *Ongoing financial support for sustained technology use*
▶ *Policies and standards supporting new learning environments*

This document is designed to provide teachers, technology planners, teacher preparation institutions, and educational decision-makers with frameworks and standards to guide them in establishing enriched learning environments supported by technology.

The resulting learning environments provide opportunities for students to use technology to find and apply current information and resources, and to apply their academic skills for solving real-world problems. These environments engage students in activities that have educational technology skills and relevant curricular content interwoven.

Traditional educational practices no longer provide students with all the necessary skills for economic survival in today's workplace. Students must apply strategies for solving problems and use appropriate tools for learning, collaborating, and communicating. Today's learning environments must incorporate strategies and tools that prepare students for their futures. The following chart lists characteristics representing traditional approaches to learning and corresponding strategies often associated with new learning environments.

ESTABLISHING NEW LEARNING ENVIRONMENTS

Incorporating New Strategies

Traditional Learning Environments	New Learning Environments
Teacher-centered instruction	Student-centered learning
Single sense stimulation	Multisensory stimulation
Single path progression	Multipath progression
Single media	Multimedia
Isolated work	Collaborative work
Information delivery	Information exchange
Passive learning	Active/exploratory/inquiry-based learning
Factual, knowledge-based	Critical thinking and informed decision-making
Reactive response	Proactive/planned action
Isolated, artificial context	Authentic, real-world context

The most effective learning environments meld traditional approaches and new approaches to facilitate learning of relevant content while addressing individual needs. The resulting learning environments should prepare students to:

▶ *Communicate using a variety of media and formats*

▶ *Access and exchange information in a variety of ways*

▶ *Compile, organize, analyze, and synthesize information*

▶ *Draw conclusions and make generalizations based on information gathered*

▶ *Use information and select appropriate tools to solve problems*

▶ *Know content and be able to locate additional information as needed*

▶ *Become self-directed learners*

▶ *Collaborate and cooperate in team efforts*

▶ *Interact with others in ethical and appropriate ways*

Teachers know that the wise use of technology can enrich learning environments and enable students to achieve marketable skills. It is still critical that educators analyze the potential benefits of technology for learning and employ it appropriately.

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The NETS
Project
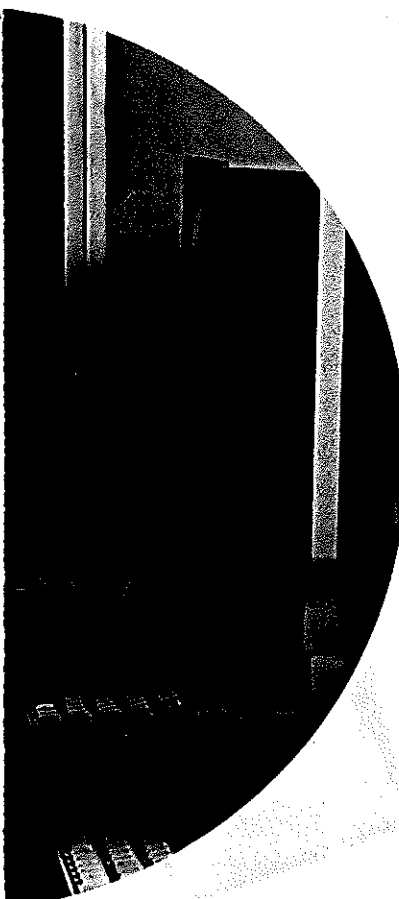
The primary goal of the ISTE National Educational Technology Standards (NETS) project is to enable stakeholders in PreK–12 education to develop national standards for the educational uses of technology that will facilitate school improvement in the United States. The NETS Project will develop standards to guide educational leaders in recognizing and addressing the essential conditions for effective use of technology to support PreK–12 education. Over the next three years the following sets of standards will be developed or refined.

NETS Documents Under Development and/or Refinement

▶ Technology Foundation Standards for Students

   describes what students should know about technology and be able to do with technology

▶ Standards for Using Technology in Learning and Teaching

   describes how technology should be used throughout the curriculum for teaching, learning, and instructional management

▶ Educational Technology Support Standards

   describes systems, access, staff development, and support services essential to support effective use of technology

▶ Standards for Student Assessment and Evaluation of Technology Use

   describes various means of assessing student progress and evaluating the use of technology in learning and teaching

The Technology Foundation Standards for Students contained in this document are the first step in the NETS Project. This document represents the responses to proposed educational technology standards from many groups and individuals across the nation who have participated in conference sessions, technology forum meetings, Internet dialogue, and individually

submitted surveys. These standards and profiles are components of a larger standards document to be released in the upcoming year that will include revised materials and a scope and sequence of educational technology performance indicators. The document will include many examples of learning scenarios where these standards are linked to content learning.

The NETS Project, an ISTE initiative, is funded by the National Aeronautics and Space Administration (NASA) in consultation with the U.S. Department of Education; the Milken Exchange on Education Technology; and Apple Computer, Inc.

The NETS Project was initiated by the International Society for Technology in Education's Accreditation and Professional Standards Committee. ISTE has emerged as a recognized leader among professional organizations for educators involved with technology. ISTE's mission is to promote appropriate uses of technology to support and improve learning, teaching, and administration. Its members are teachers, technology coordinators, education administrators, and teacher educators. ISTE supports all subject area disciplines by providing publications, conferences, online information, and services that help educators combine the knowledge and skills of their teaching fields with the application of technologies for improvement of learning and teaching.

The ISTE Accreditation and Professional Standards Committee has developed:

▶ *standards for accreditation of teacher preparation programs for specialization in educational computing and technology,*

▶ *guidelines for the infrastructure needed to support the application of technology in teacher preparation programs, and,*

▶ *general standards that provide a foundation in technology for all teachers.*

These guidelines have been adopted by the National Council for Accreditation of Teacher Education (NCATE) and are currently being used in the process of accrediting teacher preparation programs in many American universities. *Web address: http://www.ISTE.org*

4

Technology Foundation
Standards
for All Students

The technology foundation standards for students are divided
into six broad categories. Standards within each category
are to be introduced, reinforced, and mastered by students.
These categories provide a framework for linking performance
indicators found within the Profiles for Technology Literate
Students (pages 7–16) to the standards. Teachers can use these
standards and profiles as guidelines for planning technology-
based activities in which students achieve success in learning,
communication, and life skills.

Technology Foundation Standards for Students

1. Basic operations and concepts

▶ *Students demonstrate a sound understanding of the nature and
operation of technology systems.*

▶ *Students are proficient in the use of technology.*

2. Social, ethical, and human issues

▶ *Students understand the ethical, cultural, and societal issues related
to technology.*

▶ *Students practice responsible use of technology systems, information,
and software.*

▶ *Students develop positive attitudes toward technology uses that support
lifelong learning, collaboration, personal pursuits, and productivity.*

3. Technology productivity tools

▶ *Students use technology tools to enhance learning, increase productivity,
and promote creativity.*

▶ *Students use productivity tools to collaborate in constructing
technology-enhanced models, preparing publications, and producing
other creative works.*
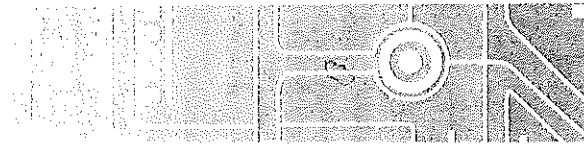
4. Technology communications tools

▶ *Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.*

▶ *Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.*

5. Technology research tools

▶ *Students use technology to locate, evaluate, and collect information from a variety of sources.*

▶ *Students use technology tools to process data and report results.*

▶ *Students evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.*

6. Technology problem-solving and decision-making tools

▶ *Students use technology resources for solving problems and making informed decisions.*

▶ *Students employ technology in the development of strategies for solving problems in the real world.*

Profiles for
Technology
Literate Students

A major component of the NETS Project is the development of a general set of profiles describing technology literate students at key developmental points in their pre-college education. These profiles reflect the underlying assumption that all students should have the opportunity to develop technology skills that support learning, personal productivity, decision-making, and daily life. These profiles and associated standards provide a framework for preparing students to be lifelong learners who make informed decisions about the role of technology in their lives.

The Profiles for Technology Literate Students provide performance indicators describing the technology competence students should exhibit upon completion of the following grade ranges:

▶ *Grades PreK–2*

▶ *Grades 3–5*

▶ *Grades 6–8*

▶ *Grades 9–12*

These profiles are indicators of achievement at certain stages in PreK–12 education. They assume that technology skills are developed by coordinated activities that support learning throughout a student's education. These skills are to be introduced, reinforced, and finally mastered, and thus, integrated into an individual's personal learning and social framework. They represent essential, realistic, and attainable goals for lifelong learning and a productive citizenry.

The standards and performance indicators are based on input and feedback from educational technology experts as well as parents, teachers, and curriculum experts. In addition they reflect information collected from the professional literature and local, state, and national documents.
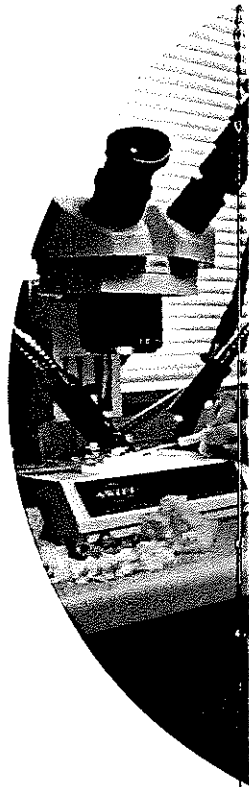
Technology Integration — Examples and Scenarios

Linked to each profile is an example or scenario that exemplifies the
use of technology by teachers and students to facilitate learning.
The scenarios describe classroom practice that reflects not only
the NETS standards and profiles, but also content standards
from curriculum organizations such as the National Council of
Teachers of Mathematics, International Reading Association,
and National Council for the Social Studies. The scenarios
provide a curricular context for the use of technology to
create varied learning environments being established
across the United States. It is not the purpose
of this document to promote the use of
technology in isolation, but rather to be
an integral component or tool for
learning and communications within
the context of academic subject areas.
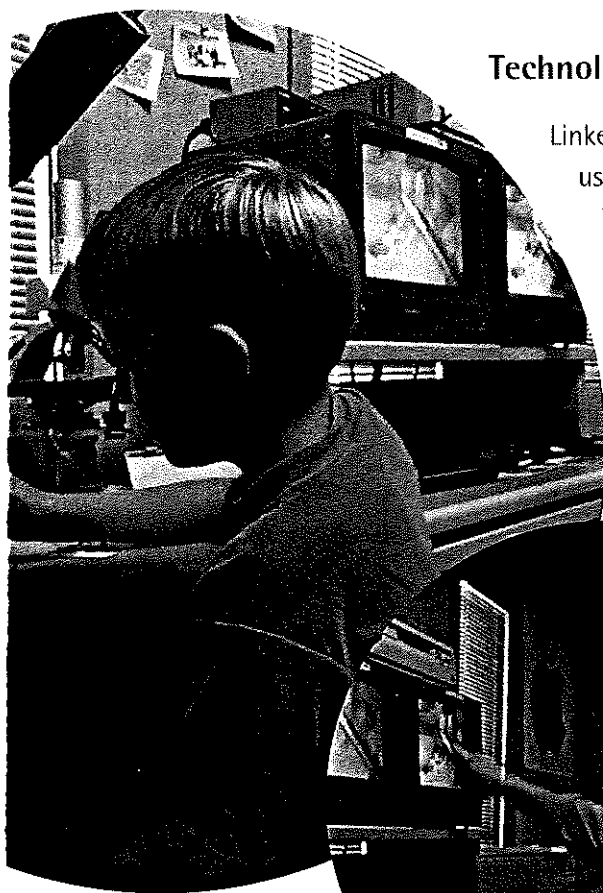
Profile for
Technology
Literate Students

GRADES PreK-2

Performance Indicators:

All students should have opportunities to demonstrate the following performances.

Prior to completion of Grade 2 students will:

Numbers in parentheses following each performance indicator refer to the standards category to which the performance is linked. The categories are:

1. Basic operations and concepts

2. Social, ethical, and human issues

3. Technology productivity tools

4. Technology comnications tools

5. Technology research tools

6. Technology problem–solving and decision–making tools

1. *Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audiotapes, and other technologies. (1)*

2. *Use a variety of media and technology resources for directed and independent learning activities. (1, 3)*

3. *Communicate about technology using developmentally appropriate and accurate terminology. (1)*

4. *Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning. (1)*

5. *Work cooperatively and collaboratively with peers, family members, and others when using technology in the classroom. (2)*

6. *Demonstrate positive social and ethical behaviors when using technology. (2)*

7. *Practice responsible use of technology systems and software. (2)*

8. *Create developmentally appropriate multimedia products with support from teachers, family members, or student partners. (3)*

9. *Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)*

10. *Gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners. (4)*

Curriculum
Examples
and Scenarios

GRADES PreK - 2

While every child may not be able to see animals in the wild, every child can see, hear, and learn about wild animals through multimedia technology. In Sharon Fontenot's class at Prien Lake Elementary School, students learn to identify polar bears, lions, and other animals from the wild and to recognize their sounds using images, video clips, and sounds from the Wide World of Animals CD-ROM. The teacher models the creative use of technology by making a tape recording based on information from the CD-ROM incorporating her own voice to fit the group's needs.

Students practice reading and listening skills by answering questions that encourage them to think about both the science and social living issues related to these animals. Where do these animals live? What do they eat? Why do some have thick fur? How do they interact with each other?

Students then create their own stories about what they have learned using Kid Pix®, a software program that allows them to make their own pictures of the animals, assemble them into slide shows, and print out their own books to share with classmates and family. The teacher videotapes the students' activities as part of their assessment and to share with students and parents.

A first-grade teacher can use this activity to introduce her class to Internet technology for the first time. Teachers worldwide use e-mail once a month to relate how many teeth their students lost along with one special fact about their region or culture. Students share tooth-fairy traditions and other stories from their region.

Using the information from students from around the world, teachers develop activities including creative writing, graphing, art, and social studies. Students use an interactive bulletin board where they post dates when teeth were lost, create a letter as a class about the project to post on the Internet, collect information from other children about tooth fairy stories, develop creative writing stories about their "tooth" experiences and share them with other children via the Internet. They can initiate electronic conversations about where the other children live, use maps to locate the countries/cities where other children live, and address topics with other children such as weather, politics, clothing, and local heroes of their regions. The students use electronic slide show/drawing software to illustrate the fairy stories and software to graph the tooth data. Then they write a letter explaining what the graph means and send it to keypals around the world.

Profile for
Technology
Literate Students

GRADES 3 - 5

Performance Indicators:

All students should have opportunities to demonstrate the following performances.

Prior to completion of Grade 5 students will:

Numbers in parentheses following each performance indicator refer to the standards category to which the performance is linked. The categories are:

1. Basic operations and concepts

2. Social, ethical, and human issues

3. Technology productivity tools

4. Technology communications tools

5. Technology research tools

6. Technology problem-solving and decision-making tools

1. *Use keyboards and other common input and output devices (including adaptive devices when necessary) efficiently and effectively. (1)*

2. *Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide. (1, 2)*

3. *Discuss basic issues related to responsible use of technology and information and describe personal consequences of inappropriate use. (2)*

4. *Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)*

5. *Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom. (3, 4)*

6. *Use telecommunications efficiently and effectively to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests. (4)*

7. *Use telecommunications and online resources (e.g., e-mail, online discussions, Web environments) to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom. (4, 5)*

8. *Use technology resources (e.g., calculators, data collection probes, videos, educational software) for problem-solving, self-directed learning, and extended learning activities. (5, 6)*

9. *Determine when technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems. (5, 6)*

10. *Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources. (6)*

Curriculum
Examples
and Scenarios

GRADES 3 - 5
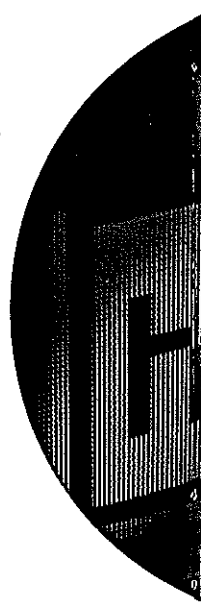
Ms. Smith and her class have made extensive use of online resources such as Exploring the Environment (ETE) found at (http://www.cotf.edu./ete) and Global Learning and Observations for a Better Environment (GLOBE) found at (http://www.globe.gov). She uses ETE to access classroom tested problem-based learning modules that extend and sometimes replace her old paper-based activities. These self-contained resources have provided a new spark of vitality into her science and interdisciplinary periods as they grapple with real-world issues and current data.

Using the GLOBE structure, Ms. Smith has been able to have her students collect information from environmental observations around the school and vicinity, report the data to a processing facility through GLOBE, and use global images created from their data to study local environmental issues. The students have been contributing to an environmental database used by research scientists to improve our understanding of the global environment.

Recently, her students used GLOBE and other electronic resources to research a hot local issue. The community was debating whether to allow a biotechnology firm to locate nearby. Her students chose to analyze this issue very carefully. Students working in groups engaged in collecting and analyzing data about the proposed plant. Ms. Smith set forums in the class so that the students could present their findings and engage in debate. Then students created Web pages to present their findings and arguments to the community. She reports that because of the authenticity and relevance of the issue, her students were even more engaged as they used technology in researching the issues. Parents were pleased to see their children's work on the school's Web site, as viewing the materials at home helped parents feel closer to what the students did in school. Parents also reported subtle changes in their children's attitudes when they were immersed in this hands-on, minds-on, technology-infused classroom.

12
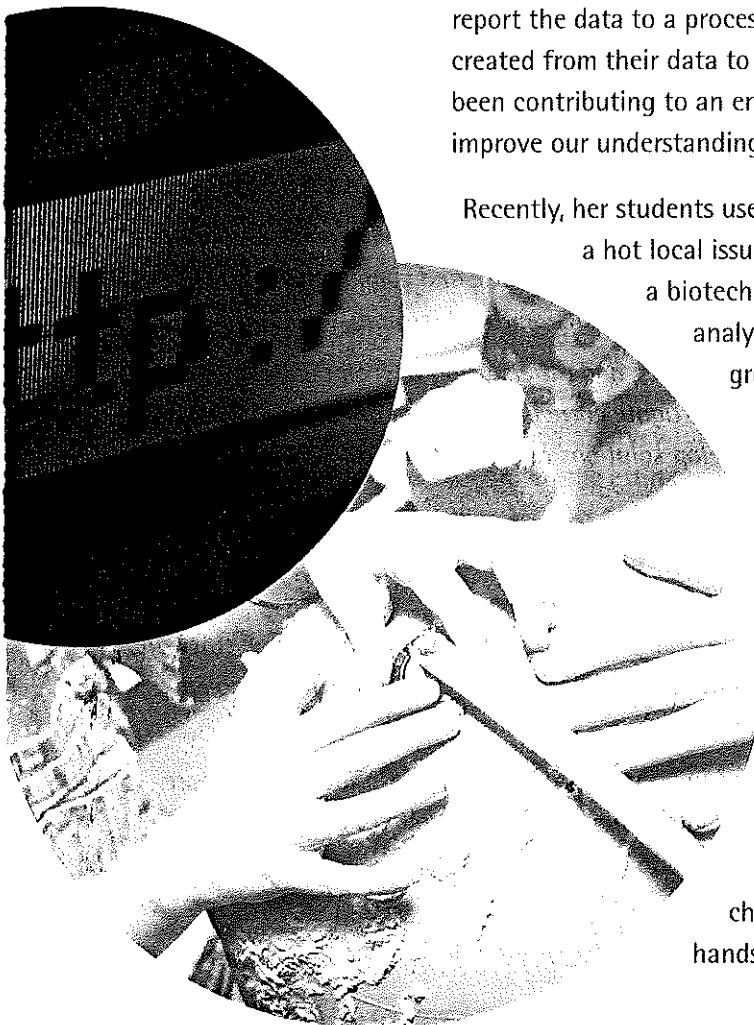
Profile for
Technology
## Literate Students
GRADES 6 – 8

Performance Indicators:

All students should have opportunities to demonstrate
the following performances.

Prior to completion of Grade 8 students will:

1. *Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use. (1)*

2. *Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society. (2)*

3. *Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse. (2)*

4. *Use content-specific tools, software and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)*

5. *Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)*

6. *Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)*

7. *Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom. (4, 5)*

8. *Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)*

9. *Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving. (1, 6)*

10. *Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems. (2, 5, 6)*

Examples

Curriculum

and Scenarios

GRADES 6-8
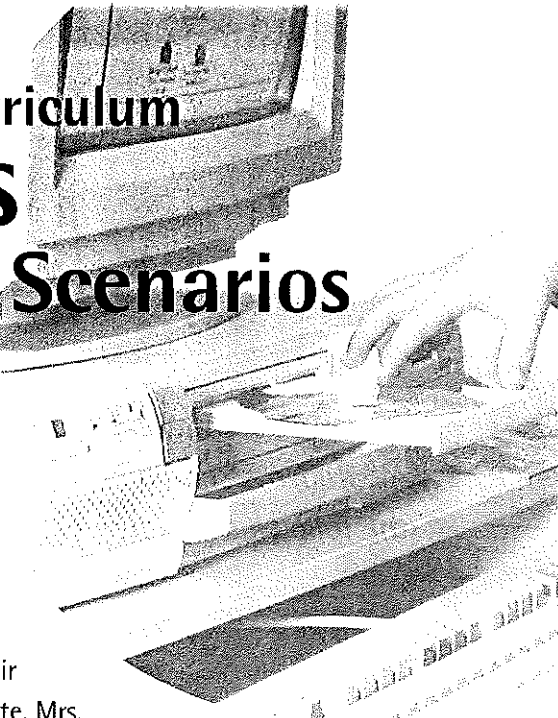
Scenario 1:

*Using Technology
to Learn about
Rocks and Minerals*

Grade Levels: 8

Technology Profile
Performance Indicators:
4, 5, 6, 7

Subject Areas:
Science, Social Studies

Source:
Hemmer, Jeanie. (1998)
Lakeisha's Year in Eighth
Grade: Technology
Integration Vignette, Part 3.
*Learning and Leading with
Technology.* 25 (7), 27-31.

Lakeisha's eighth-grade class began a unit on rocks and minerals. They explored topics using CD-ROM encyclopedias and stored both the information they found and results from their laboratory sessions, including a week-long rock-simulation program, in their databases. When their studies were complete, Mrs. Perkins helped the students create HyperStudio® presentations to share with the class. She also found an Internet site called "Ask a Geologist." Lakeisha and her classmates were then able to e-mail questions about rocks and minerals to the geologists who were sponsoring the site. Lakeisha and her friends were fascinated with the information they received on rocks and minerals in their native area. Lakeisha's science teacher organized a local geologic dig to help students begin their own rock and mineral collections.

Scenario 2:

*The Louisiana Labor
Market Lesson*

Grade Levels: 8

Technology Profile
Performance Indicators:
5, 6, 7, 8

Subject Areas:
Mathematics, Social Studies

Source:
Callaway, Becky. (1997)
Teacher and Students
Present LA Labor Lesson
at the BESE Meeting.
*Louisiana Challenge Grant
Newsletter.* 2 (1), 9.*

At Marthaville Elementary, a small rural K-8 school, Laura Strahan and her eighth-grade students studied the Louisiana labor market in their math class. Students used the Internet to access the Louisiana Department of Labor's Web site: (http:www.ldol.state.la.us/) and search for the top 20 projected occupations in the state. The U.S. Department of Labor updates its statistics daily and receives and distributes labor information from each state.

Students were divided into groups. Each group selected five occupations and developed a survey for them. Each survey was used to query other individuals regarding the estimated annual income for those occupations. The students then assisted in analyzing the survey results, comparing results to actual salaries as reported on the Department of Labor and other Internet sites, calculating averages of estimates, and displaying the information in appropriate graph format. Students from Ms. Strahan's class presented their results to the Board of Elementary and Secondary Education to illustrate the importance of providing technology resources to schools in Louisiana.

This lesson provides numerous opportunities for use of technology to access, analyze, and present information including access through telecommunications, document production using the word processor, database manipulation, analysis using the spreadsheet, illustration of results using graphing software, and presentation of the results via Web or electronic slideshow software.

Profile for
Technology
Literate Students

GRADES 9-12

Performance Indicators:

*All students should have opportunities to demonstrate
the following performances.*

Prior to completion of Grade 12 students will:

Numbers in parentheses following each performance indicator refer to the standards category to which the performance is linked. The categories are:

1. Basic operations and concepts

2. Social, ethical, and human issues

3. Technology productivity tools

4. Technology comnications tools

5. Technology research tools

6. Technology problem-solving and decision-making tools

1. *Identify capabilities and limitations of contemporary and emerging technology resources and assess the potential of these systems and services to address personal, lifelong learning, and workplace needs. (2)*

2. *Make informed choices among technology systems, resources, and services. (1, 2)*

3. *Analyze advantages and disadvantages of widespread use and reliance on technology in the workplace and in society as a whole. (2)*

4. *Demonstrate and advocate for legal and ethical behaviors among peers, family, and community regarding the use of technology and information. (2)*

5. *Use technology tools and resources for managing and communicating personal/professional information (e.g., finances, schedules, addresses, purchases, correspondence). (3, 4)*

6. *Evaluate technology-based options, including distance and distributed education, for lifelong learning. (5)*

7. *Routinely and efficiently use online information resources to meet needs for collaboration, research, publications, communications, and productivity. (4, 5, 6)*

8. *Select and apply technology tools for research, information analysis, problem-solving, and decision-making in content learning. (4, 5)*

9. *Investigate and apply expert systems, intelligent agents, and simulations in real-world situations. (3, 5, 6)*

10. *Collaborate with peers, experts, and others to contribute to a content-related knowledge base by using technology to compile, synthesize, produce, and disseminate information, models, and other creative works. (4, 5, 6)*

Curriculum
Examples
and Scenarios
GRADES 9 – 12

The U.S. system of presidential elections can be a mystery for many citizens. Teaching middle school or high school students about the Electoral College can be quite a challenge. Mr. Sanchez, a high school social studies teacher in Southern California, developed an activity for his students that involves election data from the closest presidential election in history — the 1960 election between John F. Kennedy and Richard M. Nixon. This activity helps students understand the Electoral College and some of the strategies used by presidential candidates. Complete, state-by-state election results can be found at the following Web site: http://www.geocities.com/CapitolHill/6228/elections.htm

Mr. Sanchez divides his students into groups and gives each a spreadsheet containing data from the 1960 presidential election. The spreadsheet contains the popular and Electoral College results from every state and territory. Formulas at the bottom of the columns calculate the total number of popular votes and Electoral votes for each candidate.

The groups are asked to conduct a series of investigations by manipulating the spreadsheet data. Students have printouts of the original data and the original data file on disk so that they can restore the spreadsheet after each manipulation. The questions they investigate are: "Can you change the data so that Mr. Nixon wins the election rather than Mr. Kennedy?" "Can you change the outcome of the election by changing the election results in only one state?" "Two states?" "Three states?" "Can you change the popular vote so that one candidate wins the popular election but loses the Electoral College results?" "Can you change the popular vote so that the same candidate loses the popular vote but wins the election (via the Electoral College results)?" "What is the fewest number of states you can change to have one candidate win the popular vote but lose the election?" These "what if?" activities help students gain an understanding of the Electoral College.

Finally, the groups prepare a multimedia report on the 1960 election using HyperStudio®. They can include pictures of the candidates, charts and graphs from the election (e.g., http://www.multied.com/elections/) and a discussion of their spreadsheet manipulations.
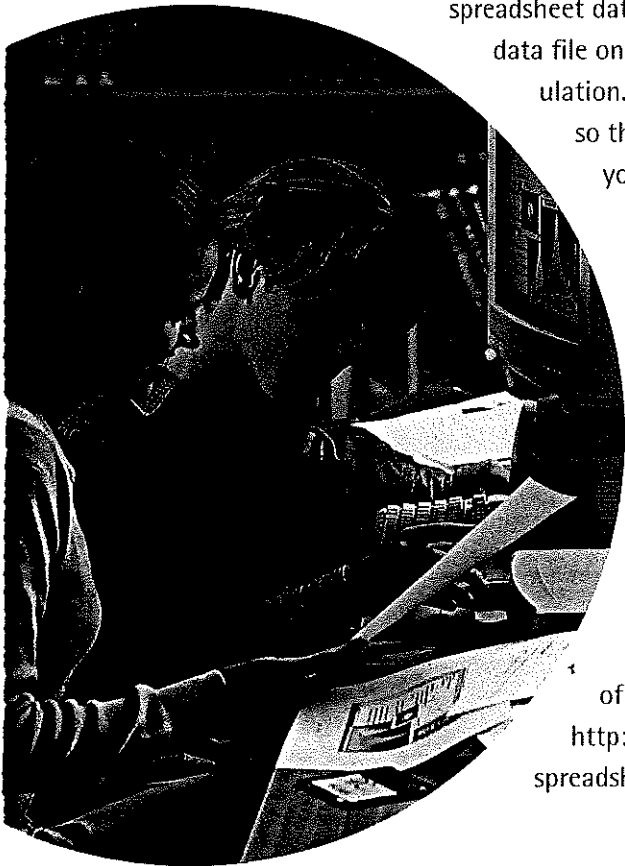
The NETS
Project
Partnership

J oining ISTE as project partners in developing technology stan-
dards for Pre K-12 education are organizations representing
major professional education groups in the United States. Each
partner organization provides leadership to a broad spectrum of
educators and includes members throughout the nation. Each
of the partner organizations brings unique strengths to the pro-
ject. These partners provide representation from the educational
community including: curriculum specialists, leaders in State
Departments of Education, school principals, teachers, school
board members, librarians, representatives from the business
community, and technology experts. The National Educational
Technology Standards (NETS) partner organizations include:

▶ *American Federation of Teachers (AFT)*

▶ *American Association of School Librarians (AASL), a division of the
American Library Association (ALA)*

▶ *Association for Supervision and Curriculum Development (ASCD)*

▶ *Council of Chief State School Officers (CCSSO)*

▶ *Council for Exceptional Children (CEC)*

▶ *International Society for Technology in Education (ISTE)*

▶ *National Association of Elementary School Principals (NAESP)*

▶ *National Association of Secondary School Principals (NASSP)*

▶ *National Education Association (NEA)*

▶ *National School Boards Association's (NSBA) Institute for the Transfer
of Technology to Education*

▶ *National Foundation for the Improvement of Education (NFIE)*

▶ *Software Publishers Association (SPA)*

As the NETS Project unfolds, it is important to note that a significant strength of the project is the participation of representatives from the major curriculum organizations. The curriculum liaisons from each subject area participate in the writing teams responsible for linking the technology standards with the standards from their organization's academic subject area. Liaisons representing major curriculum groups will participate in the development of technology standards for their subject areas. These curriculum liaisons will participate in work sessions designed to identify standards relating specifically to each curriculum area and to build interdisciplinary connections among the curricular areas. Curriculum organizations slated to join the NETS Partnership are:

▶ *International Reading Association (IRA)*

▶ *National Council for Geography Education (NCGE)*

▶ *National Council for the Social Studies (NCSS)*

▶ *National Council of Teachers of Mathematics (NCTM)*

▶ *National Council for the Teachers of English (NCTE)*

▶ *National Science Teachers Association (NSTA)*

Co-sponsors for the NETS Project have provided valuable expertise and contributed significant resources to the development of these standards. Current co-sponsors joining ISTE and the NETS Partnership are:

▶ *U.S. Department of Education*

▶ *National Aeronautics and Space Administration (NASA)*

▶ *Milken Exchange on Education Technology*

▶ *Apple Computer, Inc.*

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Malcom Phelps, Frank Withrow, James Mitchell
▶ *Milken Exchange on Education Technology*
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CURRENT STATUS AND PERSPECTIVES
FOR EDUCATION IN LATIN AMERICA

Ana Luiza Machado
Director UNESCO/OREALC
April, 9th, 2 000

INTRODUCTION

Education has gained significant ground within governmental policy, and particularly within social policy, in Latin America. This is a sector that receives a large percentage of public resources. A review of declarations coming out of meetings of the region's presidents and education ministers during the last decade highlights the high expectations that policy makers and society in general have for education. The link between education and individual and social development, overcoming poverty, and living together in peace are recurrent themes in political debate.

In light of the high political and social expectations placed upon education, let us for a moment consider the context of our region, and then see if we can arrive at some conclusions regarding the status of education during the decade of the nineties. Following that, we will look ahead to consider future prospects of the social and economic context and the challenges that the education sector faces.

I.   THE CURRENT CONTEXT

During the past decade, the total population of Latin America went from 430 to 508 million inhabitants. Of the total increase of 78 million, 76 million live in urban, and 1 point 5 million in rural areas. The population increase was accompanied by a moderate economic growth rate of 3 point 6 percent annually.

Economically, Latin America is the most unequal region in the world, one in which 40 percent of the poorest homes receive between 10 to 17 percent of national income, while the 10 percent of the wealthiest homes account for between 30 and 40 percent of the total income. Poverty remains at high levels. By the end of the nineties, 36 percent of households were below the poverty line. Progress during the decade merely allowed the continent to return to 1980 levels.

Politically, the nineties were marked by the attainment of peace within the Central America region and by the recovery and consolidation of democracies throughout the continent. Nevertheless, the region continues to suffer from high rates of violence stemming from exclusion and poverty.

From the cultural perspective, and seen from outside, Latin America represents one of the most homogeneous nation grouping in the world. But viewed from inside, the region appears as a polychrome mosaic of cultures with hundreds of dialects, dozens of languages, and countless ethnic groups, customs, and beliefs

II. STATUS REPORT OF EDUCATION IN LATIN AMERICA: ASSESSMENT OF EDUCATION FOR ALL IN THE YEAR 2000

The following status report is in large part the result of the Assessment of Commitments to Education For All in the Year 2000. The commitments of the Education For All program were:

- Expansion of early childhood care and development activities;
- Universal access to basic education and the satisfaction of basic learning needs of the entire population;
- Reduction of the illiteracy rate by one-half by the year 2000, and increase of basic education and training services for young people and adults;
- Increasing availability of basic skills education and training for young people and adults;
- Providing, through education, knowledge and skills to help people maximize their potential and improve the quality of their lives.

A general assessment of the development of education during the past decade reveals that there has been important progress in the region, but that the goals proposed at Jomtien have not all been achieved. There is much to be done in order make education for all, education from birth, education as a life-long process, inclusive education, a reality. But the decade witnessed the construction of the political and technical foundations necessary to make the achievement of these goals possible. For there is now an awareness, there is now national consensus. There are now clear diagnoses (including about what we do not know). And there are examples of successful policies.

In the following section, we report on some of the most significant points for each phase of education within recent years.

1. Early Childhood Care and Education

Coverage of early childhood care and education programs increased for ages closest to primary school entry level, principally in urban areas. This resulted in a substantial increase in the numbers of boys and girls who now enter primary school with formal early education experience.

Such programs for children from birth to 3 years of age are still limited, although the decade saw the development of non-conventional programs in this area.

This phase of education has seen a growing participation of society in general – of parents and the community in these programs, particularly for the age groups and social classes that receive less State attention. It is also important to note that the countries that have greater coverage at this level are those in which the State participates widely in the provision of such services under various guises – both formal and non-formal, conventional and non-conventional.

2. Primary Education and Learning Results

Formally organized primary education was the principal vehicle used by governments to deliver education services to the majority of the population during the nineties. This period witnessed the achievement of universal access to primary education, except for some population groups in rural areas. Still, one of the most serious and persistent problems is the high numbers (between 30 and 40 percent) of children who do not reach the fifth grade.

**Survival rate to grade 5
of primary education:
Ranges for Latin America**
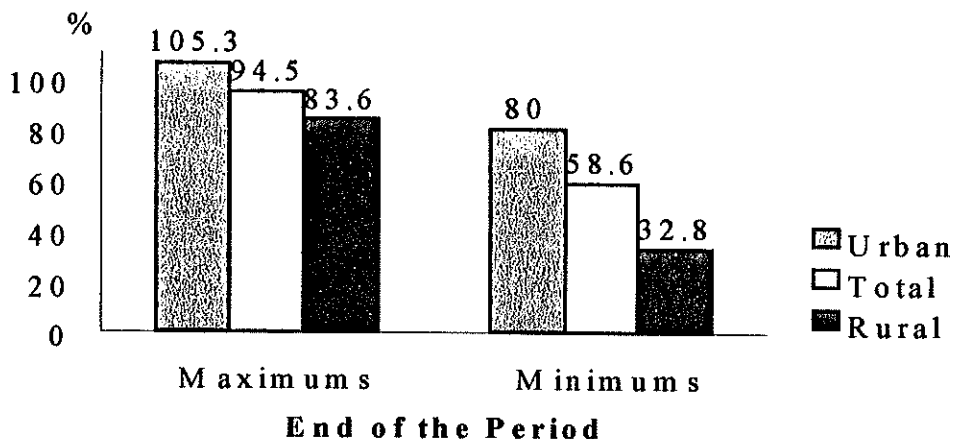
The priorities of primary education policy were to improve quality and promote equity. Among major policies put in place to improve quality were:

- Policies aimed at general improvement
- Curricular reform
- Increased individual school autonomy
- Improved provision of teaching resources and means of support
- Improved initial teacher education and skill improvement for practicing teachers
- Increased time dedicated to learning

- Focused policies aimed at improving quality with equity, applying "affirmative action" criteria
- Programs to access the quality of education

Although consensus does not exist on the meaning of the concept, "educational quality", there is agreement regarding the importance of measuring learning results in order to estimate levels of knowledge, skills, and abilities that students acquire. In order to obtain an over-all view of learning results in Latin America, we have used information derived from studies designed and carried out by the Latin American Laboratory for the

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Assessment of Educational Quality[1], which published comparable data for 13 countries within the region. The principal findings show the following:

- A high percentage of student achievement scores are best explained by factors outside of the school itself. Among those that best correlate to student test scores are social and family context variables.
- But an important percentage of the variance in student achievement is explained by factors linked to the school. This means that significant opportunities exist to develop policies aimed at changing the current situation and at considerably improving achievement results.
- Girls perform better than boys in language, while boys have better scores in mathematics.
- With the exception of one country, urban schools showed better student results than rural schools.
- The level of language achievement is low when pedagogical objectives are not met. We are teaching children to read, but not to understand or to interpret what they read. They learn how to read, but not how to learn while reading.
- In mathematics, the results are, in general, low and not uniform among countries. Students are not assimilating knowledge. Nor are they developing expected skills in mathematics. They do recognize symbols and structures on a basic level, but have little ability to solve simple and complex mathematical problems encountered in everyday life.
- Achievement differences between schools are not explained by where a school is located or how it is funded; rather, these differenes are linked to teaching practices and to school management.
- The most important finding is that a favorable classroom learning environment, by itself, is more important in learning than the combined effect of all the other factors studied.

By the end of the nineties, primary education policy declarations were giving a high priority to equity, although results in this sense were still modest. For example, although primary education coverage increased in rural areas, it is within them that a smaller percentage of boys and girls reach the fifth grade. In general, there is gender equity in terms of access to primary school, although such discriminatin may exist in indigenous, rural, and marginal-urban contexts. Information about equity is scarce and not always reliable. It is difficult, therefore, to speak confidently about the quality of education services available to marginalized groups.

Data regarding financial resources invested in primary education reveal that average investment has remained constant in most countries, varying between one and four percent of gross domestic product. This can be seen in the chart. Although the decade saw a slight increase in public expenditure per student, this has not been significant.

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[1] Coordinated by UNESCO's Regional Office and financed by the participating countries themselves, together with UNESCO, the Inter American Development Bank, the Ford Foundation, and the Andrés Bello Agreement.

Public current expenditure on primary education as a percentage of GNP: Ranges for Latin America
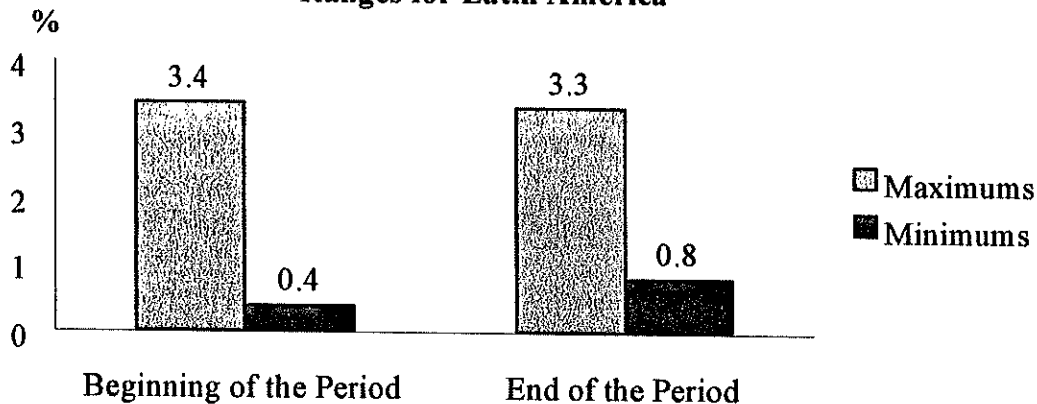
We lack the information necessary to estimate the distribution of resources and the relative weight of policy priorities in education; the percentage of expenditures directed at marginalized groups; the efficiency of spending and private expenditures on education. The lack of this kind of information limits transparency in accountability.

Teachers are key actors in improving the quality of education. They are the major source of instruction in most societies, and have been recognized as such on almost all levels of study and in the many different forms of organizing classes. In Latin America, the supply of teachers, in absolute numbers, has been sufficient to meet demand except in rural areas. Approximately 20 percent of the total number of teachers do not have the officially required certificates, although there is great disparity among countries in their requirements for teacher certification. Although measures have been taken to promote better initial and in-service training, these efforts have not produced significant changes in classroom practice.

3. Literacy and the Education of Young People and Adults

It is recognized within the region that during the nineties, literacy training and education for young people and adults were not among the priorities of education policy. This lack of priority, together with the innefficiency of school systems, which in Latin America discard between 6 and 42 percent of students before they reach the fifth grade, results in increases in the total numbers of illiterates in some countries.

Illiteracy rates fell in all countries, withing reaching the Jomtiem goal of reducing rates by half of the 1990 levels. Illiteracy is concentrated in the 24 year and over age group, as well as in rural areas, low income zones of large cities, and among indigenous groups. The higher illiteracy rate in rural areas is due to the delay in primary education reaching these areas as well as their poor performance in terms of retaining students in school until the fifth grade.

Adult literacy rate of the population
aged 15 and older:
Ranges for Latin America
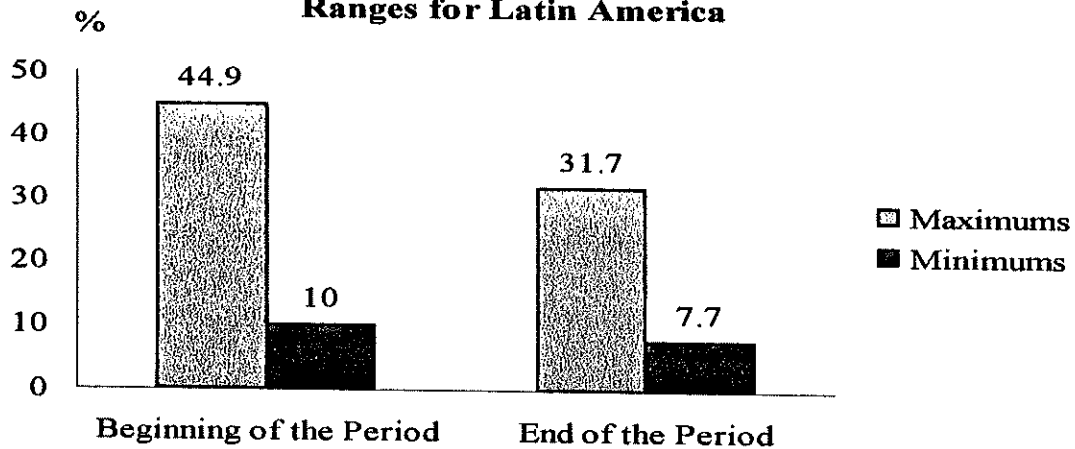
Latin America has witnessed changes in literacy training models. They are currently much more often combined with other education activities for young people and adults, such as job training, for example, and are increasingly linked to government and non-government entities outside of the formal education sector.

Another characteristic unique to the decade is that of introducing a work preparation component within these programs. This has been important in order to increase worker flexibility and mobility in a labor market that is rapidly changing.

Countries within the region show a growing interest in integrating the education of young people and adults into current processes of education reform. Literacy training programs have been distinguished by the incorporation of multiple actors, both from within and outside government.

We know in Latin America that the majority of individuals attending adult programs are young people. There is a consensus regarding the three action areas that should be given priority with participating young people: a) preferential attention to post-primary education for young people who live in poverty and have been dropped out of primary programs; b) the creation of programs that stimulate greater active participation by young people and the full recognition of their responsibilities and rights; c) programs that support and stimulate job training for young people living in poverty.

4.Training in basic skills and Education for a Better Life

Most countries have incorporated learning components in human rights, values, ethics, concern for the environment, sexuality, health, and other areas as well. In schools, "education for life" themes have been implemented both across disciplines and as separate subjects. Due to the scarcity of assessment tools and lack of systematization of information in this area, we do not know the extent to which these subjects are addressed in schools; nor do we know the impact that "education for a better life" has on the daily life of students. But the themes are an important part of the education offerings of those from outside the formal education system, especially NGO's.

Some countries make intense use of the media such as radio in the education of boys and girls as well as adults, particularly in rural and indigenous areas. But the media is used in some degree for education in almost all the countries. The region does not yet have specialized industries to develop and produce programs for students, teachers, and the general public.

The use of computers and the internet as teaching aids in the region is only beginning. Although almost all of the countries have carried out projects to adopt these technologies in schools and some have set up national networks linking schools. A key question for the region is how to utilize these new learning tools in order to promote inclusion in education and avoid a situation where hardware and software represent yet another factor encouraging inequality and inequity.

5. Achievements, Pending Themes, and Challenges

Among the major achievements in education during the nineties were:
- Universalization of coverage of primary education
- Significant increases in coverage of early childhood education
- A relative decrease in illiteracy
- A concern for quality
- A concern for equity
- The inclusion of education for life themes in both formal and non-formal, or alternative education programs
- Participation of multiple actors: NGO's, parents, social groups
- Education became a national priority

The decade also left a number of themes pending:
- High rates of grade failure and drop-out in primary school
- Scattered coverage for early childhood education, particularly for the 0 to 3 year age group
- Low priorities were placed on literacy training and the education of young people and adults
- Low student learning levels
- The persistence of social inequalities in the distribution, efficiency, and quality of education services
- Lack of communication and cooperation between different actors involved in the tasks of Education For All
- The need to strenghthen governmental policy-making
- Small increases in investments in education

The major challenges faced by education in the future are:
- To transform education into a task for all through consensus- building, participation and coordination among concerned individuals
- To achieve greater participation from parents and communities
- To respond effectively to the multiple dimensions of education problems through policies that cut across all sectors of society
- To increase coverage of early education by promoting quality alternative programs
- To substantially improve primary school quality and to achieve effective learning of reading, writing, and math

- To substantially reduce rates of grade repetition and school drop-out
- To give greater priority to literacy training and to the education of young people and adults
- To improve opportunities for girls to learn math and science in the classroom
- To promote greater gender equity in rural areas and in indigenous communities
- To assess the impact of the teaching of education for life themes in both formal and non-formal programs
- To encourage the use of the media and information technologies in order to promote equity
- To substantially increase public spending on early education, primary education, literacy training, the education of young people and adults, education for life, and the the use of the media and information technologies
- To increase the production, quality, and utilization of data on education in order to improve decision-making at all levels of the system
- To increase education system efficiency and achieve greater transparency in the use of resources
- To substantially improve the initial training, work conditions, and social status of teachers.

III.   SECONDARY EDUCATION

Secondary education was not included in the Education For All assessment. Nevertheless, given its vital importance for the region, we will here highlight its major characteristics. The progress achieved in the performance of primary education during the nineties has increased the demand for secondary education. This trend will continue. Education systems will have to be prepared to combine quantity with quality in this area. In fact, as we can see in the graph, the gross enrollment trends in secondary show a 10 percent growth between 1990 and 1997.

Gross Enrollment Rate in Latin Latin America and the Caribbean
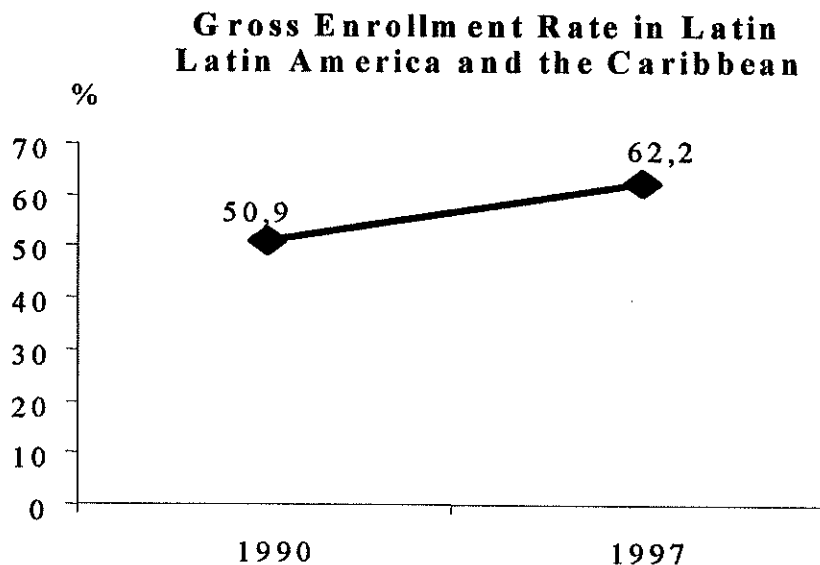
This increase represents not only an important quantitative advance in the region; it also points to access to secondary education by sectors of the population that heretofore have been left out due to geographic, social, economic, and cultural factors.

Secondary education is a priority in the region. Countries are implementing policies aimed at improving this instructional level. In order, however, to respond adequately to the growing demand, this currently weakest link in the learning chain must be strengthened. It is the weakest due, in part, to the lack of clear definitions of its purposes, its structure, and its social, political, economic, cultural, and educational functions. This lack of definition has created a state of ambiguity and disfunctionality in its approaches to curricula. Traditionally, this middle phase of education has been seen from two points of view: either as a scientific and humanistic bridge to higher education, or a specialized technical and vocational training period leading to the labor market. From today's perspective, this traditional view is lamentably out of date, exhibiting an unrealistic social perspective, disconnected from the concerns and needs of the population that it serves, of society, and the culture in which it is immersed.

The fact is that the traditional middle-level education, based upon a juxtaposition of academic subjects, each one of them usually with a separate teacher, does not lend itself to an ever more necessary unity and cohesion of approach. On the other hand, one of the most damning criticisms of secondary education is that it is divorced from the realities of everyday life, that school knowledge is not transferable to day to day living.

IV.   THE FUTURE CONTEXT

Once we have a picture of the general status of education in the region, we then need to think about the future – to consider the context within which education will develop, the demands it will face, and the kind of education services needed to satisfy these demands and aid in constructing a more just society.

First, then, let's consider the future economic and social contexts for education.

1.Sustainable Development and the Environment

With the exception of the opinions of a small number of revisionists, there is a consensus that projected world economic growth cannot be sustained if we do not change our current life-styles. It is important, therefore, that we consider the cultural obstacles to such a change - a change that will demand new life styles, new beliefs, and new social relations.

The idea of market liberalization predicted for the future ignores the fact that poorer nations, besides developing basic infrastructure, require enormous social investments in areas such as family planning, environmental protection, health care, and education. In short, they require enormous public investments in social programs.

During the last fifty years, the world's production of wealth has increased six—fold. Never in history has the world economy experienced such growth. One of the costs of this growth is the pollution and environmental deterioration that is all around us and that has provoked the search for ways to reverse these processes. The hope is that in

the future, new "clean" technologies will aid heavy industries to develop non-polluting, environmentally-friendly processes. At the same time, non-polluting activities will occupy an increasingly important place in economic growth. But all these activities require people who are well-educated and well-qualified. Clearly, future generations must be able to live in a cleaner, healthier world, and the best way to protect the environment is through the development of technology and of education.

Within the last few decades, Latin America has witnessed an ominous widening of the income gap. For a high proportion of boys, girls, and young people, economic necessity requires that they remain outside of the school system. Countless millions live on the streets and are malnourished. Women, particularly rural women have been doubly castigated by the increase in poverty. In many cases, it is more difficult for women to attend school or to continue to frequent classes because they have to help at home when they are children or because as adults, they are heads of households. The latter is the case in 20 percent of Latin American families.

In this context, one of the greatest challenges for education systems in the region within the next twenty years is to discover how to reverse this trend toward ever greater poverty or how to make sure that the education systems themselves do not continue to contribute to reproducing social inequalities.

2. Knowledge and Information

The production and accumulation of knowledge are the driving force behind development. It is for this reason that technology and education must never be apart. Currently, the situation in regard to production of scientific and technological knowledge in the region is precarious. A great effort must be made during the next twenty years to come up to speed internationally in order to be part of the technological revolution and to be able to survive in an increasingly competitive world. It is absolutely essential that training be intensified in scientific and technological research, with special attention to the training of personnel in order to overcome current insufficiencies and to be able to face new challenges created by the global economy.

Knowledge, information, and education complement each other: education generates knowledge and information. Knowledge and information promote improvements in education.

Certainly, the world of the future will be information-driven. Information technology will profoundly transform the way that people organize their lives, interact with others, and participate in all areas of social life. We should be aware, however, of the social impact of these new information technologies -- the effect they will have on work, education, culture, health, business, public services, and other areas that will be profoundly touched by these changes.

3. Demographic Aspects

The population growth rate has decreased in most wealthy countries, and has remained high in poor countries. This fertility rate is inversely related to the literacy rate of adult women; the higher the level of literacy, the lower the fertility rate. Consequently, the

population of developed countries is aging, while the demographic structure in developing countries is younger.

Nevertheless, in Latin America, population growth projection curves show an important downward trend. From the 16 percent growth figure for the years 1995 to 2000, they should be at ten-point-six percent between 2015 and 2020. The proportion of the population 15 years of age and under is estimated to fall from 31-point-six percent in the year 2000 to 24-point-nine percent in the year 2020 (Boletin Demográfico Nro. 64, CELADE - CEPAL, julio 1999).

These figures suggest that the increase in demand for education services will become relatively greater for young adults, and will relatively diminish for the 5 to 14 year-old group. There will also be an increasing demand for education services directed at the elderly.

For OCDE countries (*Education at a Glance*. OCDE Indicators, 1998), in 1996 the percentage of the population between 35 and 44 years of age with course work after secondary school was 65 percent for men and 60 percent for women. In Latin America and the Caribbean, these percentages are 26 percent and 33 percent, respectively. Enormous efforts will be required, therefore, for our region to at least equal, in the mid-term, the situation of the developed countries in 1996.

There is no doubt that education impacts population growth rates. For each additional year of education that a girl receives, the infant mortality rate drops, millions of lives are saved per year, and the birth rate falls as women begin to practice more responsible family planning. The opportunity to access more and better education services also raises education levels of parents and thus decreases drop-out rates and raises achievement levels of their children.

V.   EDUCATION: THE DEMAND AND SUPPLY

Looking into the foreseeable future we should consider the demand for education and the response to be expected from education systems.

1. The Demand

Among the demands placed upon education, we should especially note those directed at: a) assuring human development and improving the quality of life, preservation of the environment, overcoming poverty, and achieving education that excludes no one; b) contributing to regional integration and to strengthening citizenship skills; c) strengthening the development of science and technology; d) improving working conditions.

Human Development and the Quality of Life

Just as education is the key for the development of society, it is as well for the development of individuals. In this light, it is important to recall what was stated at the World Education Conference in Jomtiem in 1990 regarding basic learning needs that people require in order to overcome exclusion and to integrate themselves into the

world development process:

"Each person", it was declared, "children, young people, and adults, should be able to have access to education options in order to satisfy his or her basic learning needs. These needs include essential learning tools (such as reading, writing, oral expression, arithmetic, and problem-solving), as well as basic learning content itself (theoretical and practical knowledge, values, and attitudes) necessary to permit human beings to survive, to fully develop their abilities, to live and work with dignity, to fully participate in development, to improve the quality of their lives, to make basic decisions, and to continue learning."

The World Declaration recognizes that, "the satisfaction of these needs confers on people the possibility and, at the same time, the responsibility, of respecting and enriching their cultural, linguistic, and common spiritual heritage, of promoting the education of all, of defending the cause of social justice, of protecting the environment, and of being tolerant of social, political, and religions systems that are different from their own, respecting humanistic values and commonly accepted human rights, as well as working for international peace and solidarity in an increasingly interdependent world".

Later, the International Commission on Education for the Twenty-First Century, led by Jacques Delors, produced a report entitled, "Education Holds a Treasure" published by UNESCO in 1996, offering a view of a possible scenario of the learning needs of people in the future. The Delors Report establishes four pillars that constitute a foundation for tomorrow's learner. They are: learn to know, learn to do, learn to live together, and learn to be.

In regard to **learning to know**, people require:

- The ability to concentrate, to use memory and thought as the basis for learning;
- The ability to seek out and analyze available information;
- The ability to take active control of their own education, to adapt to the environment and to existing possibilities;
- The understanding that learning is not a linear process nor a single event, but rather a wide process that moves forward by means of a great variety of experiences outside of the classroom.

In regard to **learning to do**, people require:

- To recognize that learning is a practical process which is not solely based on abstraction and theoretical discussion;
- To go back and forth between school-based learning and every-day experience in order to integrate knowledge an action;
- Aptitudes and abilities to act based more on general competence than on specific task-related skills;
- Scientific and technical reasoning skills due to the importance that this kind of knowledge has for human development.

In regard to **learning to live together**, people require:

- The ability to participate in democratic processes within a spirit of building peace;
- An open and accepting attitude toward peoples and cultures;
- The ability to learn anywhere and to recognize that the community is responsible for the education of its members;

In regard to **learning to be**, people require:

- Self-responsibility and participation in the common goals of the community;
- Integrated knowledge of the potentialities of human beings, including an aesthetic sense, an appreciation for sport and for culture;
- An understanding that having is not the same as being;
- Education that contributes to their full spiritual, physical, and ethical, development

One of the most important traits that should be encouraged in young people is the ability to adopt a pro-active, autonomous and self-confident attitude toward life.

In general, quality, life-long education for everyone should encourage creativity, flexibility to adapt to change, the development of intelligence, to ability to be a self-starter, sociability, solidarity, self-esteem, self-confidence, and ethical integrity.

As we have mentioned, one of the greatest challenges faced by education in Latin America is to effectively contribute to overcoming poverty and social inequalities. Although the importance of education to the development process is widely recognized, much still needs to be done in order that education may truly contribute these two goals. Most poor children still receive poor quality education; education that does not permit them to break out of the vicious circle of poverty. The commonly accepted meaning of equality of educational opportunities here is that all children should have the chance to enroll in an education system. But we need to who actually enters in what kinds of establishments, and what kind of "cultural capital" they bring with them.

In order for education to be transformed in the next 20 years, into an effective tool to be used in the struggle against poverty and inequality, it is important that a way be found to differentiate the financing of education systems to that the State can provide compensatory resources for those children who enter into the system with less "cultural capital".

The coming years will offer the continent a unique opportunity to change living conditions and to assure that education constitutes an effective means to build peace, tolerance, democracy, and sustainable development.

Regional Integration and Globalization

Globalization has made us aware of the need for Latin American integration as a means to strengthen cultural identity. Integration is also a cultural phenomenon that educates. Cultural trends in the past were distinguished by lack of recognition, and even disdain between neighbors; as if it were necessary to build cultural identity by affirming one's own traditions and denying or rejecting those of other peoples. This kind of thinking now must be turned around. People must learn to recognize and value differences as positive factors in the construction of a durable regional cultural identity. At the same

time, it is important to recognize the common interests and benefits that can result from the integration process.

In a recent study entitled *Ibero-American Systems in the Context of Globalization: Questions and Opportunities* , Francese Pedró and José Manuel Rolo suggest that scientific and technological advances will continue to spring primarily from the more developed countries, which will use them for their own interests. This will create a division between the developed areas and the rest of the world, with the latter increasingly disconnected from technological progress.

The threat of this possibility should have direct implications for the school curriculum in the region, such as the obligation to teach foreign languages, the teaching of history that emphasizes common projects and achievements more than wars and divisions, a history that takes a positive, rather than a negative view of neighboring countries. A greater effort must be made to recognize and certify study, from primary school to the university, done outside of individual countries in order to facilitate our social, economic, and cultural integration.

Education is being called upon to play a key role because it is uniquely able to encourage the positive aspects of globalization and reduce the negative ones.

1.c. Generation and Incorporation of Knowledge and Technologies

The production and utilization of knowledge are increasingly important in order that countries may achieve long-range, sustainable economic growth. Education must be both efficient and responsible in training citizens able to produce new knowledge and to use it creatively. Looking toward the future, such a focus has the advantage of remaining ever up to date because it constantly attempts to narrow the gap between the education system and the future requirements of societies.

Everyone should have access to and use technology. If this is not the case, we will increase the distance between more and less-developed countries. To train for the use and development, incorporating it into daily life is one of the tasks of education. Developing countries have invested little in preparing scientists. This should create a concern to extend science education to all, to increase the training of scientists, and to demystify the daily use of technology.

The link between scientific and technological development and education has been absent, in most cases, in the definition of education policies. Improving training in science, particularly on the secondary school level, requires that we have more and better-trained teachers. Countries that do not develop integrated policies of scientific and technological development that include education components are certainly taking a short-range view. But in developing an integrated policy, a high priority should be given to the definition of policies aimed at financing national investment in science and technology. In order to do so we must be highly creative and original, as well as being aware of financing models successfully used by developed countries.

The relationship between competition and education has never been closer. We must make great efforts in Latin America to diminish the gap between us and developed countries. This is not only the case of the need to produce and make use of knowledge.

We must assure that knowledge and technologies are widely disseminated and used by all of the population.

1.d. The World of Work

It is predicted that in the coming years the labor conditions of the population will change. Even when people remain in the same job, surely they will change the way they work. The informal sector of the economy will continue to grow, and with it the vicious cycle of unstable occupations, low productivity, low incomes, and the impossibility of absorbing advanced technology.

Education, therefore, must look into the future and visualize a labor situation very different and more vulnerable that the present one. The ability to work in small groups; the use of communication technologies; the ability to be a "self-starter" and to develop and adapt one's abilities to the informal market; the ability to make more and better use of free time (working days will be shorter), should all be the objectives of training in both the formal and non-formal education sectors.

Most of these changes will have profound impacts on education. Among areas that require attention is higher education, which is not yet fully sensitive to the demands of the market. Adult education and informal, leisure leaning will be impacted as well.

We do not need to know for precisely what kind of occupation we should educate our young people, or re-train adults. Education must be increasingly more open in order to train individuals who are creative, able to solve problems, and who can accept change. Since technological innovations create new occupations or eliminate others, countries that are not prepared to train or to re-train their labor force will be at a serious disadvantage.

2. The Supply

Education systems should respond to demands placed upon them. I will concentrate my remarks on four basic points: the need for a new kind of school; a new kind of curriculum; a new kind of teacher; and new actors.

New Schools that are Open and Autonomous

If we want education to change, we have to change the school. Schools are among the institutions that are most alienated from our societies. Generally, most of the important decisions are taken for it, outside of the school itself. Decisions such as the nomination of its teachers and directors. Decisions regarding curriculum, tests, and assessment. Decisions regarding the training of its teachers have been based more on central plans than of considerations of teachers' real needs. Resources for school operation have come from a central administration. The way these resources are to be used is also decided outside. The new school must be based on administrative, financial, and pedagogical autonomy. The individual school should be concerned with managing its own personnel. It should make decisions regarding the school calendar and regarding strategies to track and assess learning achievement. It should, as well, be able to include in the curriculum subjects that are of interest to the community of which it is a part. School management should be a joint responsibility between teachers, parents, and local

authorities. In order for this autonomy to function well, all actors should be prepared and trained to work together. In the new school, inputs and processes should be subordinated to student learning. An efficient school should seek to establish a longer, more assiduous, more intense school day. Current education reforms have witnessed some interesting experiences aimed at providing incentives to autonomy and creativity in schools. These positive trends should be strengthened until schools are transformed so that, besides carrying out their fundamental missions, they become true socializing agents and community centers.

A New Curriculum and Education Resources

School curriculums should be profoundly transformed in order change the compartmentalized, subject design that is now current. Cross-cutting themes should be incorporated which contribute to the integral training of students, and which respect multiple intelligences. It could be a curriculum more centered on facilitating learning to know, to do, to live together, and, especially, to be. This kind of knowledge would thus help to counter one of the most worrisome fears of our times: the fear of not finding a meaning to life.

Education systems should consider new styles of learning marked by greater autonomy of the learner and the utilization of new technologies. The communication media and information technologies within the school system can make education available to more people – even the most distant.

A more flexible system is needed that makes learning opportunities available to people throughout their lives. The new curriculum must take into account the multiple possibilities of learning that occur outside of the classroom. By doing so, the school can both develop and strengthen in people critical thinking in regard to the media. Course content in the curriculum cannot be an end in itself. It make no sense to study language if the purpose is not to communicate more effectively orally and in writing. Nor does it make sense to study history if this does not serve to develop a critical and constructive attitude vis-à-vis society. Memorizing is not learning. Learning must be used to get along in the world, more autonomously and more creatively.

A New Teacher

A still-pending task is the training of a group of professionals able to introduce the profound changes that the education system needs in order to respond to the requirements of development. To educate in new skills for a more developed society demands teachers with different characteristics. It demands teachers who are innovative and self-starters. To prepare such teachers requires a special concern with supporting initial and in-service training. It requires: a) the creation of in-school meeting places where teachers can reflect, exchange experiences, provide mutual support, and create teaching materials; b) national and international policies for exchange of teachers and innovative experiences; c) resources for research and creativity thinking; d) reform of teacher training courses. Special importance should be given to experiments with teaching programs based on the use of new information and communication technologies.

Nothing can be changed in the school without first changing the teachers. We need less

bureaucratic teachers, teachers willing and able to take the initiative and who can use their professional knowledge to help solve the learning problems of their students. A teacher with initiative does not require to be told from someone outside the classroom. Assessments of the learning achievements of such a teacher do not have to come from outside. He or she does not have to be told that such and such a content must be given in such and such a time. But this presupposes that the education system must remove bureaucratic barriers, creating necessary conditions for freeing the self-initiative and creativity of teachers.

A teacher with self-initiative knows how to diagnose the learning problems of each student, propose adequate measures, and track the situation until the problem is solved. This is to say that, as a professional, the teacher should assume responsibility for the learning of students. But such a teacher requires a better salary and better working conditions than are the norms in our region. We should think about systems with flexible, competitive salaries which reward good teachers, salaries with fixed and variable components, with criteria that reward merit, with control systems that are close to the municipality and to the school. We should think of schools that have discretionary funds for the use of establishment. All of this means that much effort must be given to the selection and training of teachers who have a new mentality. It means we must create new stimuli such as premiums, scholarships, training courses, and salary incentives for those who work under especially difficult conditions in rural or distant areas. A teacher with self-initiative is the single most effective tool in the school. Such a teacher both teaches and learns at the same time.

Education systems should also concern themselves with such relevant themes as university-based initial and in-service training of science teachers, particularly for secondary schools. Reinforcing national capacity for the development of education material in science, besides contributing input regarding curriculum is fundamental if we wish knowledge of science and technology to be presented appropriately to students.

A new school requires a new school director. Besides the technical competence required for the position, besides pedagogical and administrative skills, aptitude for leadership is important as well. This is important not only in order to create a team spirit among teachers and students. It is necessary in order to involve the community in the life of the school. The success of a school is in large measure dependent upon the dynamism and competence of its director.

New Actors

If we wish the whole society to be educated, we need new actors who participate in the tasks of education. A policy of inclusion here requires a change of responsibility in school management. In the face of this challenge, a number of questions arise regarding the role of the State ,of the private sector, and of society in the process of educational change. Besides a more marked and more dynamic participation of teachers and of parents in the process, education should be a responsibility shared by all of society: journalists, business people, churches, legislators, and other governmental authorities not directly connected to education. Quality education for all, throughout life, demands from everyone a new viewpoint. Each sector of society should reflect on its role and do all it can in the creation of a more human and more just society, a society with citizens who are better educated and more able to live in an ever more complex world.

VI. CONCLUSIONS

These reflections allow us to identify a set of requirements that we should consider when we think about education systems in the future. All of them apply to the world as a whole, but they have special relevance in Latin America.

- Because of the complex demands placed upon them in terms of human development, quality of life, integration, globalization, the challenges of the knowledge and use of technology and because of it effects on the world of work, the education system is of the utmost importance.

- We need to imagine the building of an education system that is flexible, that is open to all, that is independent of age or life conditions; a system that guarantees what has been so often emphasized by many educators during our lifetimes: education as a right throughout life. We need to imagine a system that is open to those who have already been to school, allowing them to return. For this, we need to think of an open system that incorporates all educational resources in the society, including the media and new communication technologies.

- The achievement of an educating society truly involved and aware that responsibility is shared, and the education is everyone's task, not only that of those traditionally involved in the sector.

- The development of science and technology must be carried out with responsibility in order to not increase the gap between rich and poor countries. We need more scientists. And we need to increase the use of technology, particularly for the improvement of learning.

- We should move toward education that considers not only the transmission of knowledge, but much more: the development of all of person's potential. The strengthening of democracy, the maintenance of peace, the fostering of development demand education with a more profound ethical meaning; an ethics of solidarity which is manifested in daily life, in politics, in business, and in interpersonal relations.

- It is increasingly evident that people must be trained in the capacity to adapt themselves to changing situations, to possess cultural fluency that makes possible respect for other cultures, to be able to prevent and to solve problems, and to be self-motivating, able to become permanent learners.

- Regional integration, globalization, respect for one's identity, demand education that respects diversity, that allow us to successfully face the tensions between the world and the community, between tradition and modernity, between what is global and what is personal.

- Improving the professional and social status of teachers is crucial if we wish to construct a new kind of education that is appropriate for the new millennium. Initial

and in-service teacher training must convince teachers that they simultaneously teach and learn. This is a *sine qua non* condition for students to be able to adopt new and more adequate attitudes in their lives.

- The education system, like any other system, needs to be managed with competence and accountability. If until recently speaking about the use of management tools in education was unheard of, today it is very clear that, if such techniques are not used, it will be more difficult to obtain the financial, material, and human resources required to carry out transformations necessary in order to achieve quality education.

- What happens in the next few years will have an enormous impact on the future of humanity. And very much will depend on the kind of education that we are able to offer our citizens.

School Networks and Teachers Training

Issues at Stake - Critical Factors - Way Forward

School Networks and Teachers Training

Issues at Stake - Critical Factors - Way Forward

Lambrakis Research Foundation

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The present "Communication Document" reflects the issues discussed and conclusions drawn during the Workshop "School Networks and Teachers Training", which took place in Athens, Greece on the 18th September 1998, with the participation of EC-DGXIII TAP Projects TRENDS and T3 and the European Schoolnet (EUN) representatives.

The Workshop was organised and animated by Lambrakis Research Foundation, with the following objectives:

➔ To identify the emerging needs and difficulties in the development of school networks and distance training services aiming at teachers' continuous professionalisation, by reflecting on and connecting related projects' experiences.

➔ To explore the implications of the development of school networks, distance training services and networked learning communities for the organisation and "culture" of education systems/institutions.

➔ To inform policy-makers at regional, national and European level of the needs and priorities in setting up school networks and distance training services aiming at teachers' continuous professionalisation and school development.

Evidently, the discussion had two functions:

a. an understanding-oriented (descriptive) function, which helps all the participants analyse current needs and implications

b. a decision-oriented function (prescriptive) which helps policy-makers set priorities and targets for future action.

Members of the TRENDS Project partner institutions as well as the T3 Project partner institutions participated in the discussion, bringing their experience from school networks for teachers training and professional development. Mr Ulf Lundin, Chair of the Steering Committee of EUN, made a significant contribution to the discussion, focusing on future plans and actions for "a Network of Networks" that will, hopefully, integrate the experiences and lessons learnt from the existing national and European projects. The experience from WfS was also brought in by Mr Guus Wijngaards, former Sustained Activity Manager of WfS and currently Communication Manager of EUN.

A team of experts and policy-makers from educational institutions, agencies and Ministries were called to critically contribute to the discussion, acting as facilitators, integrators, critics and rapporteurs - when and where appropriate. It should be noted that two discussion groups were formed with the aim to explore the issues at stake from the educational researcher/designer and the policy-maker perspective, respectively (all participants are listed in the Appendix).

The quality of education is strongly linked to training of teachers. For this reason, most European countries have developed policies for training and re-training school teachers. (EURYDICE, 1995) However, for a long time teacher training was considered to be mainly a pre-service procedure, taking the form of initial training. (Day, 1997). This attitude seems to have changed in the last decades. Nowadays teachers are faced with emerging social needs and challenges and are called to respond to the new pedagogical, scientific and technological developments. The rapid evolution of new technologies in combination with the continuous societal/economic changes pose the need for on-going teachers' professionalisation and updating.

Under these circumstances, in-service training seems to be an effective training policy since it could increase transfer likelihood. In other words, the closer in time and circumstance the training is to the workplace, the more effective it seems to be. Teachers are called to solve pedagogical problems on the spot by drawing on their newly acquired skills and knowledge. In this way, practice is connected with theory and learning becomes more meaningful as it is "built" in real conditions. (Collis, 1996, pp 153-4). In the beginning, in-service training used to be carried out in certain places (schools, training centres, institutes etc.), with a fixed timetable and the continuous physical presence of the trainer. This inflexible training model set limits to the range of training activities as well as teachers' participation in the courses offered.

As a result, new training models, based on distance education methodology, have been developed. (TRENDS, Training Model, 1997, p. 6). On one hand, distance education increases instructional flexibility as to the learning method, pace, sequence, media and evaluation, helping, at the same time, people to overcome health/family circumstances and difficulties related to employment, time and travel costs. On the other hand, as Jenkins (1996) put it: "Distance education interests educational planners largely because it can deliver more learning for less resource. (...) There is no doubt that its cost-effectiveness is a major asset".

Hargreaves (Leach in Mills & Tait, 1996) and Moon (1996) have pointed out that teacher education rapidly becomes de-institutionalised and dispersed across a variety of schools and clusters. Furthermore, as Leach puts it: "Open and distance teaching and learning has, over the last twenty-five years, offered an important routeway to professional development for many teachers across the world. (...) Its underlying methodology is ideally placed to facilitate a responsive and flexible model of teacher development, shifting the focus as it does from what institutions provide to how learners can be actively engaged in the process of their own learning through a wide variety of teaching and learning strategies" (Leach in Mills &Tait, 1996).

For these reasons, the notion of networking in education has already been applied mainly in groups of schools, by activities in national and/or European pilot projects. (Collis, 1996, pp 402-405). However, the extent of existing governmental initiatives and other concerted actions differ widely within the European countries. At the same time, the pilot projects in the field have addressed the problem of high telecommunication costs as well as the related organisational shift in the educational establishments that is necessary to make the on-line educational services really useful for the school communities. (Davis in Veen et al., 1995)

In any case, the technological advancement is giving the individual school the opportunity to have fast contact with other schools and institutions, thus providing strong motivation for communication and exchange of ideas and experiences. (Kaye, 1989, pp 4-6, 10, Osorio, 1997, pp 279-281). Today, there is a variety of resources available through the international data communication networks, such as directories, guides and lists. As Mc Clintock (1996) suggests: "These technologies, deployed without reserve, do not result simply in increased information access. They result in a substantial transformation in the conditions limiting full participation in cultural and intellectual work".

The establishment of school networks to support the provision of educational services (distance learning activities, access to educational material / information repositories, school-based training of teachers etc.) is recommended as a much promising field for future collaboration between the European countries, with visible and really useful results, which will have a concrete impact on and contribute to the necessary organisational shift. (Davis, 1997, Owen, 1997, Tsakarissianos & Koutra, 1997, Van Assche et al, 1997). Co-operation should be aimed at transferring knowledge and expertise in order to enhance the operation of the education systems in the region. Mature network technologies and multimedia systems will allow educational organisations, cultural institutions and research centres to provide education and training services for the educational communities.

To conclude, network technologies and resources could be exploited for supporting an educator's in-service training model, with trans-European features (Davis & Tearle, 1998) and with the potential to overcome difficulties originating from the insufficient time in the school schedule, the cost of network access and use, the lack of administrative support, etc. (TRENDS, Training Model, 1997).

In this context, existing projects and initiatives at national, regional and local level aimed at promoting school networking and co-operation between the educational communities and the technology providers, may contribute substantially to a bottom-up development of educational networks and advance the scope of their activities at the European level. (See: Johansson, 1997, Fenoulhet et al., 1996).

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Project experiences were discussed, evaluated and elaborated, leading
to some meaningful conclusions and suggestions. These conclusions could be viewed
as "lessons learnt" and are analytically presented below:

PEDAGOGICAL LESSONS

→ A new consciousness and motivation of teachers' networks beyond national
levels is under development (e.g. EUN).

→ Teachers' professional development and students' learning prove to be parallel learning processes.
For this reason, more emphasis should be placed on the students' learning process.
In this context, an open question to be answered sooner or later has emerged:
What is the impact of teacher training on the learner as well as the interaction between teachers and learners?

→ Teachers' learning is not neutral, since there is also development
of teachers' motivation, which should be also studied.

→ A feeling of "independence" and "emancipation" has been created among teachers
as learners and it is worth-studying in more depth.

→ The individual needs of teachers according to their own context
(i.e. country, school, classroom) should be addressed.

→ There should be a possibility to put into practice what was learned in real conditions.

→ The role of tutor and the nature of tutoring prove to be cultural phenomena, which are difficult to change.

→ Openness of digital learning environments demands active learning attitudes.

→ Moderating on-line learning activities demands new teaching strategies.

→ In order to create a virtual network, we need to create a human network.

LESSONS LEARNT

ORGANISATIONAL LESSONS

→ There is a need for expanding the scope of projects in three dimensions: <u>quantity, complexity, geographical coverage</u> (at European level).

→ There is a question of up-scaling, as to <u>the number of teachers</u> as well as <u>the intermediate tools/functions,</u> pointing to a European Network of Continuous Teacher Training Institutions.

→ There seem to be <u>problems in setting up networks of teacher training institutions</u> with reasonable geographical coverage in their environment.

→ All of the current projects are more or less "top-down", since teachers themselves would probably see things differently and this is an issue. <u>Thus it is essential that this training should be done in a way that makes ICT simpler for the teachers.</u>

→ Creation of multicultural learning environments demand <u>international collaboration of moderators.</u>

→ Model of international courses may take different approaches but generic lessons are:

- *the need for an international team of national moderators*

- *national moderators acting in a web of local learning groups*

- *national learning groups together form a human network*

→ A bottom-up project needs:

- *Matching national ICT initiatives*

- *Matching national educational reforms for schools or for teacher education*

- *Matching top-down European projects such as the EUN*

TECHNICAL LESSONS

→ A need for <u>transparent and user-friendly communication platforms.</u>

→ A need for <u>involvement of all end-users made visible on the web.</u>

SCHOOL NETWORKS

WEB FOR SCHOOLS
http://wfs.vub.ac.be/

GLOBAL SCHOOLNET FOUNDATION
http://www.gsn.org/

EUROPEAN SCHOOLS PROJECT
http://www.educ.uva.nl/ESP/

THE EUROPEAN SCHOOLNET
http://www.eun.org

T3 - TELEMATICS FOR TEACHER TRAINING
http://t3.dcu.ie/t3.html

TRENDS - TRAINING EDUCATORS THROUGH NETWORKS AND DISTRIBUTED SYSTEMS
http://www.lrf.gr/TRENDS

THE SWEDISH SCHOOLNET
http://www.skolverket.se/skolnet/

SCHOOLNET UK
http://schools.sys.uea.ac.uk/schoolnet

SCHOOLS ON-LINE
http://sol.ultralab.anglia.ac.uk/pages/schools_online/Contents.html

ODYSSEAS
http://odysseas.cti.gr/index.html

CANADA'S SCHOOLNET
http://www.schoolnet.ca

TEACHNET
http://teachnet.org

TEACHERS HELPING TEACHERS
http://www.pacificnet.net/~mandel//

NEW YORK NETWORKS FOR SCHOOL RENEWAL
http://www.nynetworks.org/

NATIONAL SCHOOL NETWORK
http://nsn.bbu.com/

NETWORKING K-12
http://falcon.jmu.edu/~ramseyil/network.htm

NEC GLOBAL NETWORK CLASS (GAKKOS)
http://www.gakkos.com/top.html

NATIONAL SCHOOLS NETWORK
http://www.school.za

SCIENCEPLUS TEACHERS NETWORK
http://www.ccn.cs.dal.ca/Education/SPTN/ascphmpg.html

A+ FOR KIDS - TEACHER NETWORK
http://www.netstage.com/apluskid/

THE LEARNING COMMUNITIES NETWORK, INC.
http://www.lcn.org/

THE LEARN NETWORK
http://www.tafe.sa.edu.du/lsrsc/learn/learn.html

PROJECTS

SCHOOLS ONLINE PROJECT
http://sol.ultralab.anglia.ac.uk/pages/schools_online/

SCHOOLS ONLINE 2 -PRIMARY BRIDGES PROJECT
http://www.becta.org.uk/projects/primary/

MULTIMEDIA PORTABLES FOR TEACHERS
http://www.becta.org.uk/mmportables/index.html

NORTHAMPTONSHIRE DISTANCE IN-SERVICE TRAINING PROJECT
http://www.becta.org.uk/info-sheets/ndip..htm

THE EIFFEL PROJECT
http://www.ilt.columbia.edu/elffel/eiffel.html

THE LIVING SCHOOLBOOK PROJECT
http://www.ilt.columbia.edu/k12/lsb/index.html

THE HARLEM ENVIRONMENTAL ACCESS PROJECT
http://www.ilt.columbia.edu/k12/heap/index.html

GLOBE
http://www.globe.gov/

INTERNET SCUOLA
http://www.quipo.it/internetscuola/homeing.html

REM PROJECT
http://weblife.bangor.ac.uk/rem/rem.html

T3 PROJECT
http://www.ex.ac.uk/telematics/T3/

NETDAYS
http://www.netdays.org/

THE GLOBAL SCHOOLHOUSE PROJECT
http://k12.gsh.org/

RESEARCH CENTRES

BECTa (BRITISH EDUCATIONAL TECHNOLOGY AND COMMUNICATIONS AGENCY)
http://www.becta.org.uk

INSTITUTE FOR LEARNING TECHNOLOGIES, TEACHERS COLLEGE - COLUMBIA UNIVERSITY
http://www.ilt.columbia.edu/

IET - OPEN UNIVERSITY
http://www-iet.open.ac.uk/

INTERNATIONAL CENTRE FOR DISTANCE LEARNING
http://www-icdl.open.ac.uk

THE TELEMATICS CENTRE - UNIVERSITY OF EXETER
http://www.ex.ac.uk/telematics/

UNIVERSITY OF TWENTE
http://www.to.utwente.nl/ism/online95/campus/campus.html
http://www.to.utwente.nl/ism/online96/campus.htm

MEDIA LAB - MIT
http://www.media.mit.edu/MediaLab/Research.html

TECFA CENTRE AT THE UNIVERSITY OF GENEVA
http://tecfa.unige.ch/info-edu-comp.html#www_intro

MEDIA EDUCATION CENTRE, DPT OF TEACHER EDUCATION - UNIVERSITY OF HELSINKI
http://www.helsinki.fi/kasv/media/

TRAINING INSTITUTIONS / TRAINING CENTRES

VIRTUAL TEACHER CENTRE (NATIONAL GRID FOR LEARNING)
http://vtc.ngfl.gov.uk/

IET - OPEN UNIVERSITY
http://www-iet.open.ac.uk/PDET/online.html

BECTa (BRITISH EDUCATIONAL COMMUNICATIONS AND TECHNOLOGY AGENCY)
http://www.becta.org.uk/projects/trends/

CNDP (CENTRE NATIONAL DE DOCUMENTATION PEDAGOGIQUE)
http://trends.ac-rennes.fr

PEDAGOGICAL INSTITUTE
http://trends.pi-schools.gr

CFAECA (CENTRO DE FORMACAO DA ASSOCIACAO DE ESCOLAS DE AVEIRO)
http://trends.dts.cet.pt

CIDEAD (CENTRO PARA LA INNOVACION Y DESARROLO DE LA EDUCACION A DISTANCIA)
http://abedul.pntic.mec.es/~trends

BDP (BIBLIOTECA DI DOCUMENTAZIONE PEDAGOGICA)
http://wwwa.bdp.fi.it/trends

UNIVERSITY OF OULOU
http://edtech.oulou.fi/t3/

UNIVERSITY OF UTRECHT
http://www.ruu.nl/ivlos/t3/

UNIVERSITY OF EXETER
http://www.ex.ac.uk/telematics/t3

MEDIA EDUCATION CENTRE, DPT OF TEACHER EDUCATION - UNIVERSITY OF HELSINKI
http://www.helsinki.fi/kasv/media/

In the light of these ideas, participants contributed their views focusing on the following crucial issues, that are constituting major areas of interest and action priorities:

1) Networking people and school communities, collaborative work.

2) The organisational shift, pressure for changes "imposed on" education systems, through ICT-related innovations.

3) Communications infrastructure, networking activities.

4) Teachers' in-service training.

5) Regional and national decision-making levels (authorities and European co-ordination).

The identification of the emerging needs, difficulties and synergies in the development of school networks and distance training services aiming at teachers' continuous professionalisation, is a long-standing, open issue, considered to be a priority also in the on-going "Learning in the Information Society" Initiative of the European Commission.

The Group suggests that policy frameworks, initiatives, programmes, actions and pilot projects should be set up by approaching the aforementioned issues from two perspectives:

(a) The perspective of educational researchers and designers, who are mainly concerned with development of content/materials and didactics.

(b) The perspective of policy-makers, who are mainly concerned with issues of organisation and scalability.

In the light of the experiences derived from a number of national and European pilot projects, the contributions of projects like TRENDS and T3 and the framework established by the EUN Initiative, the Group reached a certain set of recommendations to all the interested parties, namely the public education authorities, school authorities, education policy-makers, research centres, Schools of Education, and the private sector, to the extent that it will be involved in the process.

RECOMMENDATIONS ←

The main remarks and recommendations emerging could be summarised in the following points:

A. TRAINING MATERIALS, CONTENT AND DIDACTICS

Training content and materials

→ The emphasis should not be placed on specific curricular content or prescription of materials, since a very content-specific (top-down) approach to training materials and didactics could put the European dimension of teacher training networks at risk.

→ It was pointed out that there is a lot of training materials in common among European countries. Similarly, common learning objectives could be integrated into the curricula in order to develop European citizenship.

→ Teacher training should be approached in parallel with students' learning since what and how students learn is strongly linked with what and how teachers teach.

Learning processes and didactics

→ Emphasis should be placed on training processes rather than products/materials.

→ A major priority should be the change of teachers' attitudes, since the teacher is the actual agent of innovation and change in schools.

→ Teacher training should be supported with the dissemination and analysis of models of "good practice", which can be used as stimuli of discussion, reflection and change.

→ Teachers could be involved in evaluation of existing learning materials and this reflective/evaluative activity could form part of their training and professional development.

To summarise, there is obviously a trend towards "process-oriented" pedagogy rather than "product-oriented" or "knowledge-centred" pedagogy. The activities and practices forming teachers' training and professional development are emphasised more than the nature, content and structure of training materials. It is

understandable that common learning objectives and similar learning processes can be served by various training materials in many different forms.

What is more than clear is the shift from "development of content" to "development of practices", from "text" to "context" and from the "author" to the "reader". In other words, the teacher herself is called to reflect on, evaluate and participate in the development of training content and materials. She is viewed more as a "contributor" and "builder" of her own knowledge rather than a mere consumer of ready-made training content and materials. She is also viewed as a member of a "networked community of practice", discussing and collaborating, reflecting and evaluating models, practices and materials.

B. SCALABILITY - ECONOMICS & ORGANISATIONAL FRAMEWORK

Cost-effectiveness

→ It was stressed that cost-effectiveness is needed in order to address the tremendous demand for teachers' training.
Scalability seems to be an answer to this issue. Furthermore, scalability may have a regularity effect as well as a market competition effect.

→ There is an issue of reducing the cost of teacher training among different countries but also ensuring quality, that means avoiding "easy" solutions.

→ The subject-driven demand has an effect on subsidising cost of training material development.

→ The following ideas for reducing/subsidising the cost of teacher training were presented:

- *Selecting teachers who will actively respond to training (probably not the oldest teachers).*
- *Standardisation of processes, materials, hw and sw tools.*
- *Promoting school leaders' role.*
- *Increasing modularity of training courses (individualisation of learning).*
- *Involving end-users in the production/development of services.*
- *Adopting ODL (open and distance learning) as a way to reduce costs.*

RECOMMENDATIONS

Sustainability

The issue of sustainability of continuous professional development
systems was brought into focus. Sustainability actually means to involve
teachers and re-engineer education - that is very expensive.
In this context, Training Centres may act as service providers and at the same
time subsidise costs by revenues from schools/teachers/LEAs.

Provision of services and tools

→ On one hand, there seems to be a need for policy development
to support opening tenders for providing services.

→ On the other hand, there is a need for development
of communication practices and, therefore, tools.

→ Intranets inside schools may help to develop positive attitudes to communication,
since teachers are willing to but afraid of communication.

→ Teacher training could be a gradual process, consisting of several stages
(e.g. (1) Awareness, (2) Familiarisation with IT, (3) Short training
sessions in a long period - see the Bristol experience).

→ Experience from commercial training points to the following principles in providing
training services: (a) Short sessions, (b) Need-oriented training, (c) Modularity.

Structural change

→ Another crucial issue is the number of potential trainees, since it is not realistic
not to set "priorities" in the beginning. Prioritising target groups is essential in this stage.

→ Prioritising means selecting teachers according to a set of criteria.
The question is which teachers should be targeted at before others. The most influential

or the youngest? Should all of the teachers be well-informed, anyway?

→ Learning managers are an essential "part" of the prioritising structure.

→ Teachers participate in professional development/training programmes mainly for career reasons. Their motivation is basically "extrinsic". For this reason, teachers approaching the end of their career are not particularly interested in professional development.

→ It seems that teachers' expression of interest (self-selection) is a realistic "point" to start with.

→ Of course, we should not forget that there is also a "political" goal: Teachers should be provided with equal opportunities for training and professional development since equal qualifications of teachers also mean equal qualifications of students.

C. TRAINING DESIGN PRINCIPLES

→ *Acknowledgement of existing individual competencies.*
Teachers and trainers are adults who have already developed a set of competencies, some of which may be certified by official titles and qualifications, some others may not. In a continuing training perspective, recognition of competencies acquired on the job is fundamental both to motivate learners and to achieve a complete picture of competencies available in a given group.

→ *Intersector user groups.*
The opportunity of creating inter-sector user groups (including teachers from school, university, vocational training and industrial training) is motivated by the need of breaking consolidated habits of teaching and stereotypes about what happens in "other" education/training contexts.

→ *Integration of classroom, ODL, context -based learning.*
Teachers' training should try to integrate ODL segments with some

RECOMMENDATIONS

conventional classroom-based group activities and some
project work based on the work-context of the teacher.

→ *Integration of ODL scenarios.*
ODL is no longer a single-paradigm approach: in addition to tutored
self-managed learning, teachers should have the opportunity to try virtual
classrooms and networked collaborative learning, in order to experiment
with the advantages and the limitations of each approach on their
own learning, before proposing them to their trainees/learners.

→ *Core-content on standard competencies.*
The content basis of a teacher training system should be focused
on agreed standard competencies directly related to the design, management,
support and evaluation of the teaching /learning process.

→ *Open to new, non pre-codified content.*
As a balance to the previous principle, content should, however, not be a close set,
but openness should be built in the system, in order to incorporate new content
(modules) corresponding to changing needs and specialised competencies.

→ *Support to contextualisation.*
Every effort should be made to show the relevance of competencies
offered by the system to help solving the concrete problems that a teacher can face
in her/his context. Activities should encourage immediate test of newly acquired
knowledge and skills in the school environment; collection and processing of
information from the teacher's environment in project work should be required.

→ *Mixed funding.*
Every stakeholder of teachers' training should invest something to guarantee

her/his/its committment. This does not necessary mean cash: working time, engagement, other forms of material and immaterial support are, anyhow, expression of investment.

→ *Trend to demand-led.*

Although in an initial phase a public authority may define objectives and content of training to be provided, in the medium and long term the teachers' demand should be detected and the training system should progressively evolve towards full responsiveness to user needs/requirements.

→ *Concerted strategy / autonomous management.*

Whilst it is absolutely legitimate and advisable that all interested parties are consulted and possibly involved in making the main choices about the training system to be developed, the day-to-day management of the system should be autonomous to guarantee reactivity, effective trouble-shooting and accessibility of responsibility centre.

→ *Plurality of content and service providers.*

Only one content and service provider would hardly offer the excellent coverage of all content and service areas and would not offer sufficient choice of approaches and resources. A training system for teacher and trainers must maximise the access to relevant resources and services and should be open to competitive offers.

→ *European design and implementation.*

If a training system for teachers and trainers is designed in 1998/99, it must reflect the process of European integration and provide its users with the opportunity to communicate with teachers and trainers in other European countries, to collaborate with them in several teaching areas, to exchange study visits and to share evaluation approaches.

D. TRAINING DESIGN "MATRIX"

This "Matrix" is an attempt to identify interrelations and interdependencies between possible fields of action and approaches, adopted in designing teacher training programmes through school networks, and areas of results that are to be affected.

AREAS AFFECTED	PRIORITISING TARGET GROUPS	STANDARDS	LEARNING MANAGERS	MODULARITY	END-USERS INVOLVEMENT
MATERIALS PROCESSES		++		++	
USE OF ICTs AND TELECOMS		+			
CHANGE OF WORK ATTITUDES	++	++	++	++	
ECONOMIC & ORGANIZATION OUTCOME	++	++	++	++	++

As it can be seen in the table above, certain decisions and strategies may have an impact on certain aspects of the training process as well as outcomes. The "crosses" (++) imply a possible significant impact. The absence of "crosses" does not necessarily mean "no impact at all". It rather shows that the impact on those areas cannot be easily predicted or defined.

The Group reviewed the main accomplishments of the Projects TRENDS and T3 as well as their exploitation perspectives. The latter are presented in the following tables:

PROJECTS' EXPLOITATION PERSPECTIVES

T3 (Telematics for Teacher Training)

→Sustainability of on-line strategy of collaborative delivery thrives best if partners invest same workload.

→Commercialising services from partner institution across Europe not likely to take place: lack of human network.

→Thinking of best practices for mixing bottom-up and top-down approaches

TRENDS (TRaining Educators through Networks and Distributed Systems)

→Building on established contacts between Public Educational Authorities (Network of Centres) as well as between schools, teachers and training bodies.

→Use of TRENDS School-based, Distance Training Model.

→Use of TRENDS Training Course in the Use of ICT in Teaching and Learning.

→Sustaining a Network of Teacher Training Centres (service providers) in Europe and supporting ICT-related innovations in the various national environments.

→Disseminating results and experience, particularly to projects of EC Joint Programme on Education Multimedia.

→Further validating educational services model and cost-efficiency with ISDN Network in Europe.

A C O M M O N   B A S I S   F O R   D E V E L O P M E N T :   T H E   E U R O P E A N   S C H O O L N E T

Objectives and Future Actions

→ To move from small projects to large groups.

→ To encourage end-users' involvement - at the level of teachers.

→ To promote the role of learning managers (tutoring process).

→ To collaborate on the basis of common or complementary project results.

→ To integrate the pedagogical suggestions (on training content,
materials and didactics) with the framework of the "Training Design Matrix" (see above).

→ To inform and benefit the European SchoolNet (EUN) in the development
of the following areas: (a) The Virtual Workspace, (b) The Virtual Teacher College,
promoting research and development in didactics and collaboration of schools,
teachers and students at European level.

→ To use this "Communication Document" as a basis for the
developments in the EUN Framework.

→ The TRENDS Training Centres together with other Training Institutions
all over Europe should proceed with the building of a Network to provide
on-the-job training and relevant support for school teachers, thus materialising
the concept of the "Virtual Teacher College" in Europe and establish a
"Network of Excellence" of teachers' continuous professionalisation, to face
the challenges imposed by the Information Society's impact on Education.

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WORKSHOP

School Networks and Teachers Training
18 September 1998, Athens, Greece

With the participation of **EC-DGXIII TAP Projects TRENDS** and **T3,** and **EUN representatives**

To:
Members of the User Group of
the TRENDS Project

Athens, 20 January 1999

Dear Member of the User Group,

For anyone being involved in the field of ICT driven innovations in education, it is more than evident that making teachers familiar with the new learning media and practices and, further to that, making them understand and command their new role in the learning process, is considered the major task for the sustainability of the school systems.

At the same time, the existing teachers training systems, in most of the European countries, consist mainly in pre-service and some in-service training, provided by the authorized, mostly public training institutions, namely Schools of Education (Universities), Teachers Colleges and Education Research Centres. More particularly, in-service training, being a costly exercise, is provided in a rather accidental way, in varying forms and schemes in the different countries or even regions, being dependent a lot upon political factors and the availability of public funds in certain time periods.

These observations and ideas governed the initiative of a group of twenty European organizations (see attached brochure), from Britain, France, Spain, Portugal, Italy, Greece and Denmark, to launch the project "TRENDS – TRaining Educators through Networks and Distributed Systems", addressing the issues of in-service training and continuous professional development of school teachers, by developing and validating school-based, on-the-job training schemes, based upon distance learning and ICT enabled (telematics) methodologies. The participating organizations validated their teachers training methodology by providing training to some 120 European secondary schools, connected with a minimum 64kbps bandwidth, and 2,400 teachers, who are still participating in pilot activities, with the National Training Centres, after the official termination of TRENDS as a Telematics Application project
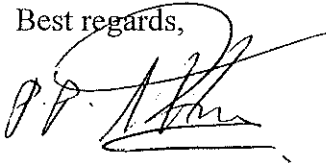
The TRENDS project, together with the projects T3 and REM, were supported by the Telematics Applications Programme of the European Commission (DG XIII). TRENDS focused more on the organizational aspects of the enterprise, validating distance, school-based practices for the delivery of on-the-job training to teachers as professionals. An important aspect of the project was the effectiveness and sustainability of the public educational authorities to act as training services providers.

We are now investigating the possibilities of building on the experience gained through TRENDS and trying to further elaborate the models developed, in a more user-driven environment, meaning actually the involvement of other Teachers Training Institutions in Europe. To this end TRENDS, together with the EUN Initiative and T3 organized a Workshop on "School Networks and Teachers Training", in Athens, in September, the results of which are presented in the attached *Communication Document*.

We do hope that you will find it interesting and purposeful and we are looking forward your reflections.

Best regards,

Nikitas Kastis
Research and Development Director

International Society for Technology in Education

ISTE Recommended Foundations in Technology for All Teachers

I. Foundations. The ISTE Foundation Standards reflect professional studies in education that provide fundamental concepts and skills for applying information technology in educational settings. All candidates seeking initial certification or endorsements in teacher preparation programs should have opportunities to meet the educational technology foundations standards.

A. Basic Computer/Technology Operations and Concepts. Candidates will use computer systems-run software; to access, generate and manipulate data; and to publish results. They will also evaluate performance of hardware and software components of computer systems and apply basic troubleshooting strategies as needed.

1. operate a multimedia computer system with related peripheral devices to successfully install and use a variety of software packages.
2. use terminology related to computers and technology appropriately in written and oral communications.
3. describe and implement basic troubleshooting techniques for multimedia computer systems with related peripheral devices.
4. use imaging devices such as scanners, digital cameras, and/or video cameras with computer systems and software.
5. demonstrate knowledge of uses of computers and technology in business, industry, and society.

B. Personal and Professional Use of Technology. Candidates will apply tools for enhancing their own professional growth and productivity. They will use technology in communicating, collaborating, conducting research, and solving problems. In addition, they will plan and participate in activities that encourage lifelong learning and will promote equitable, ethical, and legal use of computer/technology resources.

1. use productivity tools for word processing, database management, and spreadsheet applications.
2. apply productivity tools for creating multimedia presentations.
3. use computer-based technologies including telecommunications to access information and enhance personal and professional productivity.
4. use computers to support problem solving, data collection, information management, communications, presentations, and decision making.
5. demonstrate awareness of resources for adaptive assistive devices for student with special needs.
6. demonstrate knowledge of equity, ethics, legal, and human issues concerning use of computers and technology.
7. identify computer and related technology resources for facilitating lifelong learning and emerging roles of the learner and the educator.
8. observe demonstrations or uses of broadcast instruction, audio/video conferencing, and other distance learning applications.

C. Application of Technology in Instruction. Candidates will apply computers and related technologies to support instruction in their grade level and subject areas. They must plan and deliver instructional units that integrate a variety of software, applications, and learning tools. Lessons developed must reflect effective grouping and assessment strategies for diverse populations.

1. explore, evaluate, and use computer/technology resources including applications, tools, educational software, and associated documentation.
2. describe current instructional principles, research, and appropriate assessment practices as related to the use of computers and technology resources in the curriculum.
3. design, deliver, and assess student learning activities that integrate computers/technology for a variety of student group strategies and for diverse student populations.
4. design student learning activities that foster equitable, ethical, and legal use of technology by students.
5. practice responsible, ethical and legal use of technology, information, and software resources.

International Society for Technology in Education

NCATE Unit Accreditation Guidelines

The suggested changes in unit guidelines to strengthen the support for technology integration into professional teacher preparation programs were submitted by ISTE to NCATE for consideration in development of the new guidelines. The NCATE Unit Guidelines Committee incorporated the following changes that support the use of technology in teacher preparation programs. These were approved May, 1994, and implemented in Fall, 1995.

Content Studies for Initial Teacher Preparation

Candidates complete a sequence of courses and/or experiences to develop an understanding of the structure, skills, core concepts, ideas, values, facts, methods of inquiry, and uses of technology for the subjects they plan to teach.

Pedagogical Studies for Initial Teacher Preparation

Candidates complete a well-planned sequence of courses and/or experiences in professional studies in which they acquire and learn to apply knowledge about:

- the impact of technological and societal changes on schools;

Candidates complete a well-planned sequence of courses and/or experiences in pedagogical studies that help develop understanding and use of:

- educational technology, including the use of computer and other technologies in instruction, assessment, and professional productivity.

Faculty Qualifications

- Higher education faculty are knowledgeable about current practice related to the use of computers and technology and integrate them in their teaching and scholarship.

Resources for Teaching and Scholarship

- Faculty and candidates have training in and access to education-related electronic information, video resources, computer hardware, software, related technologies, and other

similar sources.
- Media, software, and materials collections are identifiable, relevant, accessible, and systematically reviewed to make acquisition decisions.
- There are sufficient library and technical staff to support the library, instructional materials collection, and media/computer support services.

Resources for Operating the Unit

- Facilities and equipment are functional and well maintained. They support computing, educational communications, and educational and instructional technology at least at the level of other units in the institution.

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iste ——

ISTE Customer Service:　　E-mail: _____　　Fax: 541.302.3778
480 Charnelton Street　　　　Phone: 800.336.5191 (U.S.)　**Webmaster:** _____
Eugene, OR 97401-2626 USA　　　　541.302.3777 (Int'l)　**Web site:** _____

Tools for Change - building the knowledge base for macro-systemic change

(or...what to put in the bookmark of the future)

Global trends

Problematising our conclusions

Approaches to change

Building the evidence base

Missing papers

Conclusions

Global Trends

McDonalds

evidence based policy

accountability

awareness of the entrepreneur

business desire to create new uses for ICT

Global Trends in Education

shared rhetoric on education

increased focus on education

converging curricula

academic capitalism
    knowledge creation
    internationalisation of qualifications
    plurality of provision
    non-traditional providers
        university trends
    knowledge is power

Problematising the New Intellectual Agenda

from bucket to philosopher [Everyone!]

knowledge about knowledge
  relativism (Perry)
  accepting constructivism

the 'meta' generation
metacognitive skills (Schoenfeld) (Paul)
  self monitoring
  self knowledge

knowledge of social functioning

teaching students to respond to change

working with new representations and symbol systems
(TIMSS)

modelling complex processes and problems (Sigrid)
  social and environmental issues

learning to know; to do; to live together; to be

moral judgement
knowledge of self
critical self-awareness (Eduardo)

Evidence Based Practice

Campbell

what bookmarks are for...

medicine: the Cochran collaboration

Kinds of Evidence

Phenomena   *Herminia case histories*

    this happened

Regularities

    when you do \<A\>, then \<B\> happens

Models

    accounts to link regularities

Uses

    access

    critique

Styles of Modelling

Analytic

Systemic

Macro-systemic

predictable

unpredictable

	Analytic (cf. classical physics)	Systemic (cf. biology)	Macro-systemic (c.f. evolution)
Learning Theory	Skinnerian conditioning	models of memory	Piagetian and Vygotskian cognitive development
Ecology	field trials	predator-prey relations	ecology changes
Education Systemic Reform	expts/quasi expts	?	?

Macro-systemic Change in a Relatively Stable World

Ecological restoration requires:

vision

rich and accurate descriptions of:
    elements (environments, plants)
    communities of plants
    plant*environment match

evaluation systems for health and diagnosis

knowledge of
    stable systems
    transitions
    time lines
    pathology
    fixes
    resource implications

\

Promoting Macro-systemic Change under Relatively Stable External Conditions

Knowledge of Where You Are Now

descriptions of elements and settings

descriptions of systems

A Vision of Where You Want to be in 1 year, 2, 5 and 10 years
David P; working group

Ideas on Plausible Transition States

Descriptions of treatments: what does it NOT include?
prerequisites
resource needs
fine grained descriptions
klaus; Alnaaz; Don

What is easy or difficult to do?
effect sizes
treatment lifetime
Jot

Feedback tools

More Vision!
Bernard; Toni; Lilian + Marcela;
Edla + Tania Mara ; Antonio
Ana Luiza

How do we ENGINEER Macro-systemic Change in Unstable Worlds

satisficing not optimizing

exploring affordances

fail forwards; ready, fire, aim; fail fast, fail often:
Gail

cybernetic feedback

> change goals en route

> fast dissemination

Centers for Evidence Based Policy and Practice

> clarity about knowledge claims

> vivid descriptions of phenomena and effects
>   (separate from theoretical accounts)

> rival epistemologies

Problematising Analytic Methods

the 'treatment' is ??

dilution and corruption

non-uniform effect sizes

new goals, and multivariate goals

(systemic and macro systemic issues about the knowledge engineering and user communities)

Problematising EBP in Systemic Reform

system definition

Vittorio on MEDEA

Lea on EducaDi

      generalisation and system capacity
         teaching via LOGO
            competent teachers?
            accommodation?

    parameter estimation
        time
        effect size as function of treatment
        costs

    systems issues
        unexpected outcomes
            financial implications of de-schooling
            time on ICT trivia
            faster asset stripping of poor countries

Jimmy

Problematising Macro-systemic Change

research is just one sense making activity

challenge to 'academic' knowledge
    engineering versus science

Papers the Printers Forgot from Poland and Peru

Why 20 years of ICT has had only modest effects

The negative impacts of ICT   Iliana; Anaaz; Wing

The 10 worst ICT-based lessons I ever saw

A battery of assessments for new educational goals

How to distinguish valuable/useless classroom activities

How teachers use on-line support   Jan (2003)

Conclusions

Practical Urgencies

we need bookmarks to help EVERYONE

educational engineering is at least as important as theory

the school of the future is a complex system
     located in a local, national and global system

we need to consider systems issues seriously
     macro-systemics seriously

we need to create centres for Evidence Based Practice
     explore users uses
     support all communities

we need 'utopian thought'
     vivid exemplification
     appropriate assessment systems
     robust quality assurance

We need to get real...
     analyse failures
     demonstrate real learning gains

Theoretical Urgencies

we need a new science of change

we need to understand knowledge creation and implementation

to order to create the 'meta' generation

we need to revisit
    the development of ideas about knowledge
    cognitive development
    the development of metacognition
    the development of morality and ethical behaviour

we need to explore the development of 'new intelligences'
    Machiavellian intelligence'
    Sternberg, Gardner

Jaap

" Intelligence is the ability to use existing tools in new ways"

New Learning in New Contexts

David Squires (UK), (chair)
Toni Downes (AUS), Klaus-D Graf (GER) (rapporteurs)
Betty   Collis   (NL),   Paul   Jansen   (NL),   Mike   Kendall(UK),
Graciela Sosisky (ARG)

1.   INTRODUCTION

Whenever we talk about 'new' learning the old question arises "Is there really anything new?". The discussants in the focus group agreed that what is new is the rapidly changing context in which today's learners live, work and learn and the social condition that change is now a constant in our lives. These social, economic and technological changes, and the condition of constant change challenge us to re-evaluate, re-engineer and where necessary create new purposes and processes for learning.

The discussants accepted that the purposes of learning we need for an ever changing world are well encapsulated in the statement of the International Commission on Education for the Twenty-First Century, led by Jacques Delors (UNESCO, 1996). They are: learn to know, learn to do, learn to live together, and learn to be. As a general statement, it is seen to apply across nations, and in different and evolving social, economic and technological contexts.

The processes of learning most associated with 'new learning' seemed to fall into two main categories. Many pick up on processes of yesteryear which lost prominence when learning was institutionalised through the establishment of mass schooling and the paper-based technologies such as text-books shaped the nature of schooling. Such phrases include 'lifelong learning', 'learning through apprenticeships', 'just in time learning'. Others which include 'learning to learn' and 'constructivist learning' and 'scaffolded learning' draw upon new theoretical understandings but are contested in the worlds of government policy and classroom practice. These processes, along with the processes that currently dominate traditional forms of schooling, and which are considered successful by many communities, policy makers and professionals, need to be re-evaluated and re-engineered in terms of how they meet the above defined purposes of education with the changing contexts. The group agreed that the new technologies play a special role in new learning and new contexts because technological change is not only a key factor generating pressure for change, but also a key facilitator through providing new tools to enable such change.

2.   THE CHANGING CONTEXTS OF LEARNING

In order to more clearly identify the pressures on 'new learning' we defined some key outcomes of the changing contexts. These are the blurring of traditional boundaries, the

redefinition of global and local, the changing role of various social groups and institutions in the enterprise of education, and the trend to client-led from institution-led education.

2.1   The blurring of boundaries

One key aspect of change is the increasing blurring of boundaries between dimensions such as time, space, and informal and formal working learning. Today workers can engage in international transactions from their home offices, children can vicariously experience a volcanic eruption on their television screen while it is actually happening and students in one classroom can co-operatively solve problems with students in classrooms in another city, country or even continent. Similarly boundaries are blurring between informal and formal learning, between levels of formal schooling, further study, work-place learning and life long community-based learning. We observe, older members of the community working within schools to hand on their knowledge and skills and wealth of experiences, younger and older learning and working together in community settings to solve social and environmental problems, and workers undertaking formal study within their workplace.

Another observation relates to the continuing blurring of boundaries between teaching and learning. As well as the recognition of teaching as a reflective practice where teachers increase their own knowledge and understanding from their experiences and their interactions with learners, students are increasingly assuming teaching roles as 'more capable' peers.

2.2   The redefining of global and local

Learners experience school as a place where they access locally known and controlled resources. With the appropriate ICT infrastructure in place, learners are able to access people, content and opportunities for learning on a global basis. The learners' relationship to the local and global contexts is changing to a situation where the distinction is blurred and they are simultaneously in both. It is now possible, and common, for students to be working with fellow learners on shared learning objectives, in real time, where they are not readily aware of their co-learner's location. As more people are able to experience both, either vicariously or for real, the learner will need to be able to operate effectively in both, moving effortlessly between the two. For example, learners of different ages and in different countries are now able to share ideas, forming part of their community, addressing the diaspora of their local communities through the internet, with for example, UK members of the Chinese community being one with other Chinese wherever they are in the world.

With a redefinition of the local and global, local forms of social community in which people of all ages engage for learning, citizenship and work, will themselves be redefined. The changing forms of social community, with learners' redefining and managing their learning environments, can lead to people forming different local communities that provide shared social values that extend beyond learning. The local forms of social communities can lead to the revitalisation of the village, whereby services that can be accessed from anywhere in the world, such as banking and health care are removed for economic reasons from local communities does not lead to the villages demise, but provides new communities of teleworkers and telelearning.

An old African proverb states, "it takes a whole village to educate a child" in the local and global village! Paradoxically the arrival of new technology could make this the slogan of the future.

2.3   The role of other players in the educational enterprise

So far main players in formal education have been teachers, carrying most of the educational activities, and state or community officials (decision makers in education) generating policy and distributing resources. Today there is growing influence of other players, such as students

themselves, parents interested in the future of their children and other institutions with special interests like churches.

However, business and commerce are rapidly becoming the very influential. They either want to influence education for their own interests (staff training) or want to sell education to make a profit. So education is going to be for sale – public education will compete with private provision. This is changing the range and nature of economic circumstances in schools and the nature of influence on education. We observe increasing numbers of private schools, charter schools run by corporations, industry funded universities, accredited private (for profit) providers of technical and further education. The sale of supplementary educational services to increase achievement in schools is also on the increase. The most recent phenomena is the trend for Internet Service providers to develop educational content, often edu-tainment, as a marketing tool for their services. Given these scenarios public schooling will either diminish or change its role and expand.

2.4   A trend to client-led education rather than institutional-led education

There is a discernible move to a client-led focus to the provision of learning opportunities. Clients in this context may be individuals or organisations. From an individual perspective the idea of lifelong learning resonates with the notion that learners will be able to avail themselves of personally relevant learning activities at their convenience. From an institutional perspective, organisations are increasingly seeing the need to develop bespoke training/learning environments for their members, e.g. the emergence of 'corporate universities'. The implication of this move will be that the balance of control will shift from the provider of learning (the teacher) to the consumer of learning (the learner).

Technology-mediated contexts will have a significant role in enabling a client led focus. The capacity of technology to 'iron out' temporal and spatial boundaries will act as a stimulus in developing an educational market in which clients can purchase educational provision provided in forms suited to their individual/organisational needs.

3.   RECOMMENDATIONS

The following recommendations follow from the above observations.

a   Past paradigms of learning need to be critically appraised in terms of how they facilitate the necessary learning in our changing and increasingly complex world. For example, teachers must be ready to move from an instructional role to a facilitation of learning role. In particular they need to hold onto what works, while being courageous enough to question long traditions at the same time.

b   New relationship between emerging actors in the educational scene need to be explored. For example, productive partnerships between local governments and commercial agencies and between the parents and the teachers will be essential. The blurring of the boundaries between learning and work, community and school, the private and public provision of education make this essential.

c   Productive relationships and partnerships need to be brokered. Educators should not wait to react once relationships are imposed.

d   Change must be recognised as variable in an increasingly complex and chaotic educational process. The consequence of this is that educators need to be advocates for their own professionality and for the common good of education for all.

e

DRAFT

Changing roles of the teachers and pupils with ICT

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1 INTRODUCTION

Whether the school of the future remains a largely physical entity or becomes a virtual presence in our future society, teachers in such schools will have very different roles from those they have traditionally exercised or, indeed, play today. Not only will their role change – so also will their relationships with pupils, with other teachers, with teacher educators and the various individuals and groups in society who are stakeholders in the education process.

2 THE CHANGING ROLE OF THE TEACHER WITH ICT

A number of "push" factors are triggering educational change and are helping to shape the way to, and the design of, the school of the future. One incontrovertible result of these synergistic processes is that the school of the future will incorporate a significant ICT component.

In many countries Governments are intent on creating an "Information Society" and are investing heavily to ensure both the technical resource base and the appropriate infrastructure is being put in place to allow complete interconnection of their societies – societies where all their citizens are conversant with, interested in, and able to use ICT in their employment activities and during their leisure time.

Already, many children, right across the globe, have grown up in our increasingly technological age – they have always known and used computers, electronic games, multimedia resources and the many, different elements of advanced communications technologies. They expect their educational experience to offer them learning environments which are fully supported by ICT. In these environments they can use ICT tools as and when desired – the computer, the Web, the mobile phone, videoconferencing and integrated media production tools. They expect all this and so, increasingly, do their parents who are fast becoming more involved in the education system.

All teachers adopt a professional approach to education. They are keen to enhance their teaching skills and to improve the learning environments and experiences they create for their learners. They wish to teach as effectively as possible and to make these experiences interesting and enjoyable. Many are convinced of the powerful educational advantages ICT offers the teaching and learning process and enthusiastically integrate ICT-based activity into a wide range of classroom activities. These teachers have often been a persuasive force in bringing ICT to the

attention of their colleagues who, convinced by demonstrations of good practice, are then prepared to adopt ICT in their classroom work.

These pressures to incorporate a growing element of ICT into the teaching and learning process are being exerted at a time when education is experiencing major pressures to change. A number of paradigm shifts including:

- From a transmissive to a constructivist approach

- From teaching based environments to learning based environments

- From a hierarchical to a networked structure

- New roles and relationships of teachers and teacher trainers

- From control to monitoring

are combining to create an educational landscape markedly different from that of a decade ago - a landscape which will inevitably be much altered in the near future.

All of the above multi-sectoral factors will contribute to the shape and structure of the school of the future. They will foster new sets of relationships between learners, between learners and teachers, and between teachers and their teacher educators.

The traditional delivery and establishment of content is becoming less important. Rather it is the acquisition and development of concepts and skills which will characterise the school of the future. This new approach should create flexible, thoughtful and creative learners – skilled in the use of educational resources (particularly ICT tools), as and when desired or required, to access information, mould this information into knowledge and then apply this knowledge to the solution of problems, the assessment and resolution of issues and the appropriate transfer of conclusions to a variety of audiences. In the near future learners will be empowered to learn how to learn.

If this learning shift is to be achieved teachers as well as teaching will have to change. The changes to the education system will set new expectations of teachers and modify the portfolio of desirable competencies and skills they will be expected to demonstrate. With an enhanced ICT component figuring prominently in the school of the future teachers will have to be ICT literate – not necessarily technical experts but confident and competent users and deployers of ICT. They will integrate ICT as and when necessary in their curricular activities and should be flexible, thoughtful and creative enough to take on new or emergent applications of ICT, decide how best they can support the learning process, and incorporate them into their teaching and learning environments – in a "just-in-time" way.

Teachers will need to be ever aware of new pedagogical developments and competences related to improving the learning process. They should be prepared to explore, accept, reject and , where appropriate, integrate these. Like their learners they will need to embrace cooperative and collaborative philosophies and become team players in the education process – able to work across a range of subjects or curricular areas and support an investigative/problem solving constructivist approach to learning. Teachers of the future will have to respond flexibly, thoughtfully and sensitively to the many needs and different learning styles of their learners. They will also need to be able to design and manage new learning environments where the development of concepts and skills can be best promoted.

These new facets of the teacher in the school of the future have important consequences for teacher educators. While many teacher educators have investigated and embraced new educational paradigms and techniques they have often appeared less than enthusiastic in their adoption of ICT. Teacher educators should respond to the challenge of ICT and be leaders in its exploration. They should actively promote ICT as a cross-curricular resource or toolset and demonstrate to their trainee teachers good practice in the use of ICT. Effectively the teacher educators should model best practice and encourage their students to view ICT as a set of powerful tools which assist their personal productivity as well as promoting their professional and

pedagogical expertise. Students should leave teacher education institutions aware of new pedagogical approaches, comfortable in the many uses of ICT and prepared to increasingly experiment with its use to support all aspects of learning.

While many powerful push factors bear on education there are other powerful traditional forces in operation which are resistant to "change in the order of things". A new pattern of education is unlikely to appear quickly and the transformation to the school of the future will be slow, unless the energies of these push factors (social, political, economic, enviromental, technical and cultural) are focused on breaking the circle of tradition which is prevalent in education.

This circle can be broken in many ways. Any initiative should start from the needs of the teachers and should be designed to build teacher confidence. Initiatives should encourage active participation of parents and social agencies – all of the stakeholders in the educational system and the school of the future. These initiatives are likely to be most effective if they are focused on creating communities and networks at many different levels – local, regional, national and global.

The world is full of such initiatives. Some of the most successful have targeted the connection of schools to allow collaborative and cooperative projects to develop between schools, teachers and pupils (notably the Enlaces project in Chile) or to provide central resource gathering centres (such as the National Grid for Learning in the UK, the European Schoolnet project and a similar initiative in Canada). In Denmark attempts to establish or develop teacher competence in ICT have been based on teacher acquisition of an Educational Drivers Licence – a development which already has included 25% of the teacher work force and has been extremely successful when a whole school approach is used. Cooperative learning initiatives have been established in France and ICT development as a communication tool has been a feature of considerable educational activity in Israel and Iceland.

It would be valuable if these initiatives were brought together and then promoted throughout the educational community. It is also vital that they are implemented with sensitivity for the socio-cultural conditions pertaining in their respective countries.

3   RECOMMENDATIONS

Cognisant of the many interacting factors which influence the development of the school of the future we would make the following recommendations which we consider would assist its creation:

- Define measures to encourage the creation and development of teacher communities.
- Encourage teacher communities to share ideas, models, methodologies, experiences, and materials.
- Encourage cooperation among the teacher community members.
- Provoke paradigm shifts in Teacher education institutions.
- Disseminate project based teacher training processes based on ICT.
- Develop ICT competencies of teachers in the context of projects in which these skills are required.
- Provide local frameworks in which teachers can find both technical and pedagogical support.

4.   REFERENCES

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DRAFT

Theme 3: Schooling, School Culture, Organisation of the School, School in the Information rich Society

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Keywords

Vision, , knowledge, wisdom, school

1   INTRODUCTION

The theme of school, the school's culture, and the organisation of the school in the information rich society energised the Focus Group to consider visions of education that would apply to the many different cultures and many different goals.

2   VISIONS OF THE FUTURE

Moving into the future, the Focus Group agreed, called for a future oriented vision. While this might seem to be self-evident, a discussion of Schools of the Future must, after all, engage in discussions of the future, the Focus Group believed that it was important to begin with what should be and must be in the future instead of an alternative approach which would begin with the present, state the problems and prospects of present practice, and then work toward ameliorative plans and programs that would push toward some eventual goals. Similarly, the Focus Group believed that it was important to establish a vision that had a far reaching time span-ten-twenty, thirty or more years ahead-rather than discussing a future three or four years from now, the standard frame of reference of hardware and software providers. Similarly, the Focus Group agreed that the scope of the schools' work should be as broadly defined as possible, and goals should be directed toward many different types of school activities, policies and practices while all of those must be global in their focus and impact.

Such a broadly based vision calls for the highest degree of human interaction. So the Focus Group said that in order to achieve its vision the school of the future must strive to achieve coordination and connectedness in order to create new knowledge from the old, yielding wisdom, which is acquired through collaboration.

Such a dynamic, comprehensive vision calls for a reconceptualisation of many different but vital components of schools: their architecture, their timetables, and the types of accountability measures used. Similarly, current ideas about appropriate uses of technology must be broadened and each country's culture of schooling and of change will need to be re-examined and/or changed. Part of that culture, the role and the dynamics of the "youth culture" in each country, must be analysed with a view toward understanding the ways youth engage themselves in knowing and learning, and the ways that such engagements develop and grow.

It would be uptopian to expect that such visions could be achieved without discussion and debate. For example, it is certainly the case that from one country to another and within countries there are dualisims-idealism vs. utilitarianism and the economy as a constraint vs. the economy as a reality. Similarly, looking to the future must address the question of whether a school is a "physical entity" or is.an "idea" situated in many different places at many different times. But, while recognising that there would be inevitable debates about key issues, the Focus Group believed that peoples around the world would accept and adopt visions that moved from knowledge acquistion to wisdom attainment. Key factors in knowledge acquistion are students' interests, skills and roles, teachers' competencies, beliefs and roles, and the community's goals, beliefs and resources. Key goals of wisdom attainment are the engagement of students in authentic, important learning, the involvement of teachers with students, the community and each other, and the community's investments toward change.

Toward those ends, both the acquisition of knowledge and the attainment of wisdom call for models of change, even when those models have been shown to have been unsuccessful because lessons can be learned from both successful and unsuccessful change efforts. Moving towards knowledge and wisdom also calls for strategies for sharing stories of change, and understanding what we are moving from, where we are going and why. Visions for the future also call for identifying the scaffolding needed for change. Similarly, as schools look to the future there must be an understanding of why schools today are designed and organised as they are in order that the implications of past practice may inform future policies.

Since the creation of schools of the future will be more broadly based than today's schools, the Focus Group also agreed that future schools' planning will call for an understanding of the relation between humans but, equally important, will call for an understanding of the relation between humans and nature.

3   METAPHORS FOR THE VISION

Words often convey less of a vision than other types of representations but metaphors have the power to make comparisons that are visual and/or vital, and so the Focus Group looked for a way to convey the breadth and depth of their vision via metaphors. Discussions of the ways schools around the world planned for change and the types of schools resulting from the plans led to the question of what "school" meant in different cultures. In Sanskrit "school" means "an abode of knowledge"; in Danish "school" has the meaning of "a direction toward a vision" and in China, "a place for acquiring the knowledge of how to behave." Chile envisions school as a community of actors participating in a social enterprise while in Israel the school is " the house of the book"—"beit hasefer." All of the metaphors connoted a process as well as a place where knowledge and wisdom can be attained, and so the Focus Group agreed that such metaphors encapsulated the essence of their vision for the School of the Future—places where students, teachers, and the community would engage in activities directed toward wisdom.

DRAFT

Focus Group 4: Connectivity and Networking

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Keywords

A, B, C, D, E

1. Introduction

The discussions of Focus Group 4 were concerned with concepts of connectivity and networking. The discussions were concerned with a range of fundamental aspects of developing connectivity and networking in relation to emerging and new educational systems. Four aspects were considered:

- How will networking challenge school function?
- Future skills and competencies required.
- The virtual school.
- The child in the learning society.

2. The outcomes of discussions

How will networking challenge school function?

It is clear that the development of connectivity and networking to support traditional and emerging educational systems arises from two fundamental perspectives: central concerns (such as concepts of how centralist provision might operate); and individual concerns (such as concepts of the benefits and advantages to the individual learner). Currently there are a number of drivers which are likely to challenge current school function. In a number of countries, such as the UK, it is recognised that the transition from primary to secondary schools is often associated with a decline in engagement, interest, attendance, positive attitude, and learning attainment of pupils. From a student perspective, this decline is associated with shifts towards pupil disatisfaction, and parental perceptions and expectations can often also shift towards disatisfaction with current educational provision from schools. Under these circumstances it is clear that both pupils and parents could opt for alternative systems of education based outside or alongside schools. Changing attitudes towards learning engagement have been recognised when computers have been accessible on the streets of towns in Brazil, for example. Parents in some areas are already choosing to support their children at home when the time comes for them to revise for examinations (in the UK, using BBC material, for example).

For schools which have already become involved in shifts towards more provision via connectivity and networking, it has been found that often this has been associated with circumstances where there have been financial pressures for change. Schools have responded in these ways when financial resources have become more limited. Even when financial resources are not limited, positive increases in home learning have been found in some countries, such as the USA. Other countries could easily follow the models set by those countries involved in this emerging pattern.

In some countries companies and organisations have already been involved in the production of resources to support school learning at home (for example, in Spain). Under these circumstances the involvement of stakeholders, where schools are working alongside, with, or potentially in competition with provision from commercial sources, can shift significantly. The constitution of stakeholders and business involvement will be a need for consideration by schools in the future. Some countries are already considering the potential advantages or needs to shift from a subject-based to a topic-based or theme-based curriculum (in France, for example). Schools are currently equipped to provide subject-based curriculum educational provision. For a topic-based or theme-based curriculum, the internet offers, through resource links, and project-based approaches, ideal opportunities for provision to meet the needs of students who might want to pursue their learning in these ways. Development of non-subject based, relevant curricula could well be provided through internet-based resources in the near future.

Fundamentally, the challenge to school function is based upon shifts in power and control. In terms of power, the shift can be towards parents. In terms of control, the shift can be towards students.

Future skills and competencies required
In terms of future skills and competencies required, students will clearly require an understadning of facility of use in terms of literacy in handling of information, as well as appropriate skills to use and create networking. Managing continuous change will be a future skill and competency need not only for school managers, and teachers, but also for students.

The virtual school
The development in practice of virtual schools is clearly an aspect worth considering in the context of this debate. Certainly the development of such schools will require an understanding of both the strengths and weaknesses of virtual schools. An understanding of the costs of setting up virtual schools will also be needed, although costings prepared to date (in Sweden, and in the UK) suggest that costs are reasonable comparable to setting up traditional schools.

One problem which the setting up of virtual schools may face, is that many will need to start from traditional starting points. It seems important under these circumstances, therefore, that developmental experiments need to start from different positions – from traditional school, existing virtual school, and 'green field'starting points. Examples already exist of virtual schools in some countries (Distance School, in Germany, and Open School, in the UK, for example). In other countries, shifts in organisational practices have been identified in traditional schools moving towards more virtual school situations (the close-distance approach of rural schools in Sweden, for example, where students attend the school for 3 days during the week, and work outside the school for 2 days each week). The production and sale of specialist expertise and resources has also been developed by certain schools at this stage (in Sweden, for example). Revision material, supporting individual endeavour, and offering lesson objectives, resources, and schemes of work for courses run in schools has enabled some students to work on materials outside school and to attain at

substantially earlier times than some of their peers (in the UK, for example). The use of laptops is also enabling some schools to become mobile schools (in Sweden, for example).

A range of factors is affecting, and will affect in the future, the ways in which implementation and practice of virtual schools can develop. There is a clear role of vision, but where schools are subject to successive initiatives that need to be rationalised, this can lead to a response to vision which leads to a 'crisis vision' rather than an informed vision necessarily. Under such circumstances, mechanisms of integration of initiatives become more vitally important. A virtual school development will need to consider the factor of how continuity of training and development will be handled, as developments of this nature will be concerned with continuous change rather than with change moving to a plateau position. Developments will also need to consider those significant elements for change, and those not requiring change. Monitoring and review mechanisms, and frequency of review will need to be considered. Hand-over time, for example, from primary to secondary school, can be reconsidered so that the break periods between terms become more fluidic. However, if students do undertake home learning through virtual schools, then the responsibilities for home learning will also need to be addressed. In order to fulfil the needs of virtual schools, the shape of networks and the origin of networks will also need to be accommodated. Futures of physical infrastructures will also need to involved with vision and strategies for the future.

The child in the learning society
Fundamentally, a major issue for learning will be the need to reconsider and potentially reconceptualise the assessment of outcomes of learning. The origin of control of assessment, and the nature of control of assessment are central to this concern.

6. Conclusions
A number of key conclusions emerge:
- The development of virtual schools raises issues for all those who will be touched by this endeavour (whether they be staudents, teachers, parents, education directors).
- Providers of learning environments can be outside schools, and student needs can be sourced by a variety of providers.
- A culture needs to be developed which creates acceptance and use of the new forms of provision.
- The potential for alternative educational and school systems has to be established.
- Individual learners can now be the central focus for the provision.
- Learner-focused skills will be needed in the areas of using and creating networking, including a literacy of handling information.
- Teacher-focused skills will be needed in the areas of maintaining skills in a period of continuous change.
- Strengths of both traditional and of virtual schools need to be considered.
- Systems thinking needs to involved, to challenge current or traditional systems concepts, and to consider integrative potential.
- Possibilities of different forms of virtual schools in different contexts needs to be considered.
- Physical infrastructure needs to match virtual school needs.

- Assessment needs, methods and mechanisms should be considered in fundamental ways.
- Support of coursework or project work assessment should be considered.

Virtual school developments raise a number of challenges:
- Who holds the intellectual propert rights (IPR) of resources developed, and how the publishing processes are handled.
- The need to express these concepts to teacher educators in ways which enable them to become involved actively.
- Identifying appropriate criteria and evaluation of student outcomes.
- The relationship and linking up of the range of potential actors involved.
- The challenge for leaders and managers who will be leading the transition.

Internet Connectivity in US Public Schools

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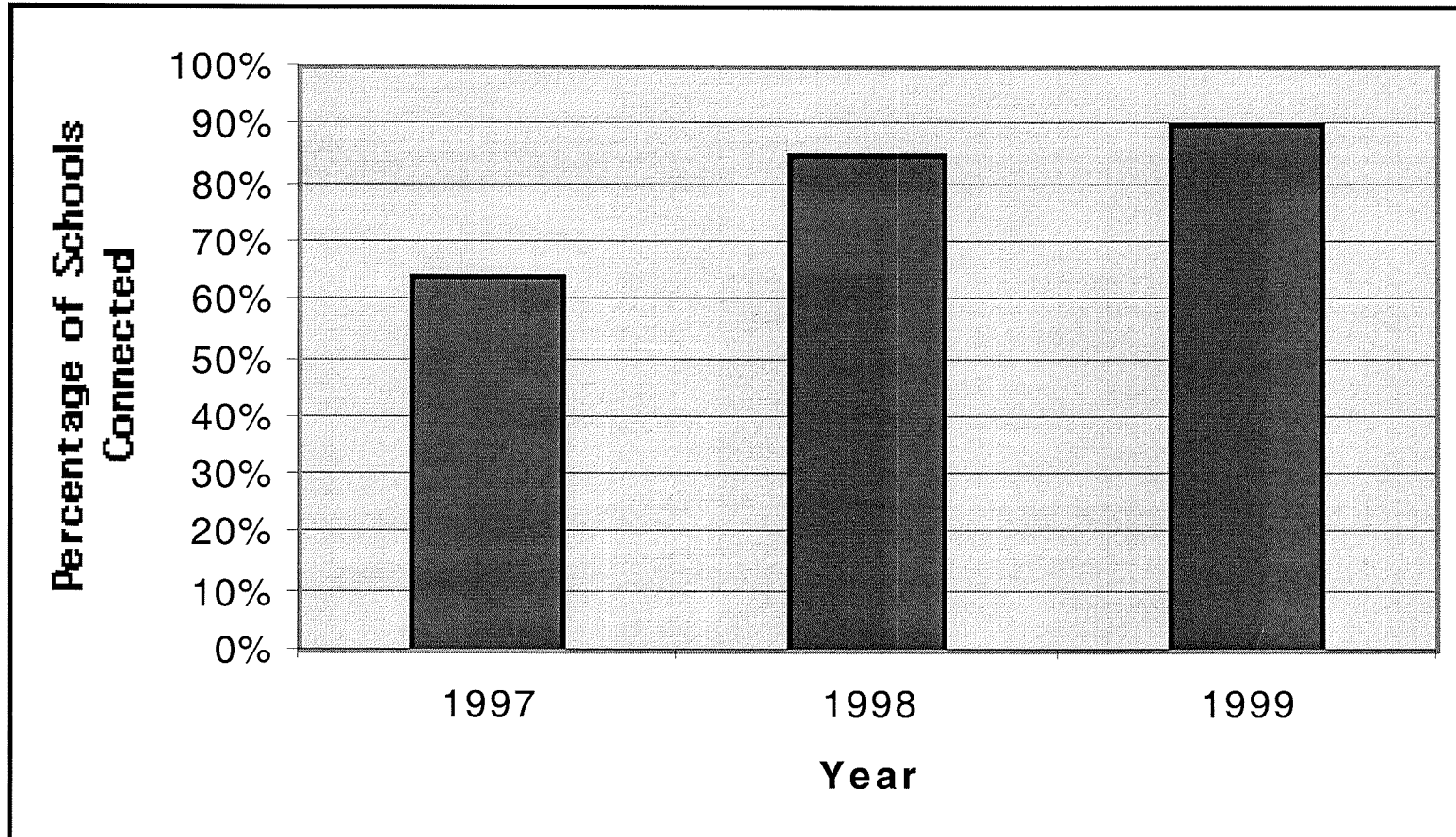
Internet Connectivity in New Zealand Schools

3
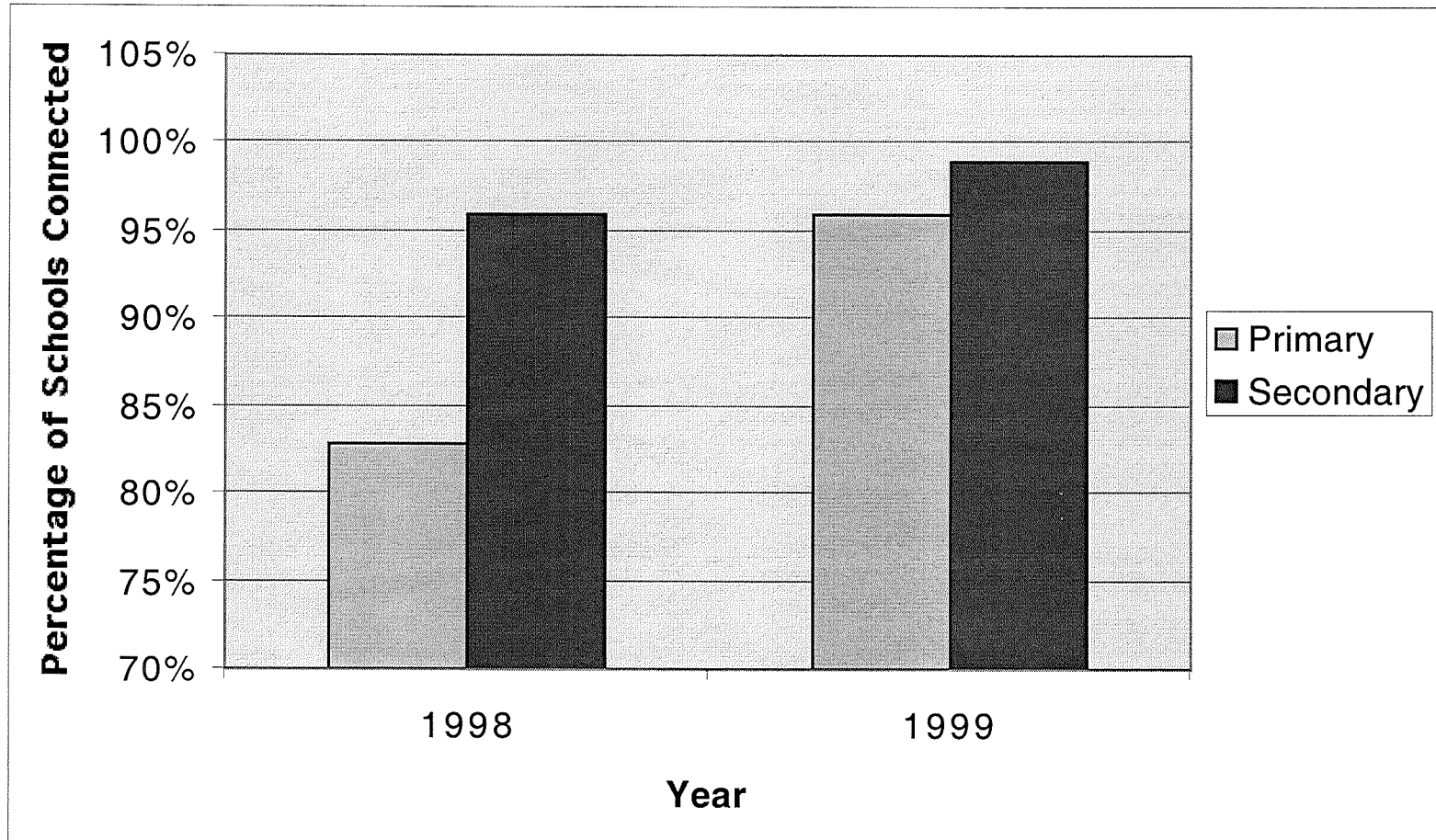
A Thinking Curriculum

"In a thinking curriculum, students develop an in-depth understanding of the essential concepts and processes for dealing with those concepts, similar to the approach taken by experts in tackling their tasks. For example, students use original sources to construct historical accounts; they design experiments to answer their questions about natural phenomena; they use mathematics to model real-world events and systems; and they write for real audiences".
(Herman et al., 1992, p.17, cited from
http://www.crcssd1.calgary.ab.ca/tech/otn/learn/teacherrole.html)

• Teachers are no longer just seen as content-experts, but also as facilitator, coach, manager, as well as co-learner.

'What Matters Most: Teaching for America's Future'

"What teachers know and can do is the most important influence on what students learn. Educators and policy makers can talk about things like governance structures, instructional methods, curricula, and standards – all crucial elements in making school more effective for children – but that connection between student and teacher is something we can get passionate about...Teaching is what matters most"

(Available at http://www.tc.columbia.edu/~teachcomm/What.htm)

5

'Interactive Education Strategies for Schools'

- Provide opportunities for authentic, independent, and collaborative learning;

- Provide access to a wide range of changing and developing information sources;

- Enable active participation and application of knowledge in authentic contexts;

- Enable learners to be more focused on inquiry, problem solving, synthesis, and other higher order thinking skills;

- Provide opportunities to focus on the acquisition and use of information skills" (Ministry of Education, 1998, p. 7).

'Interactive Education Strategies for Schools'

In one of these programmes in 1999, the following topics
were included:

- Basic Word Processing for Beginners
- Finding Your Way Round the Windows OS
- Creating a Slideshow on Claris
- Creating Presentations with PowerPoint
- Using Digital Cameras and Enhancing Graphic Images
- Creative Writing for Juniors
- Developing Web Pages with MS FrontPage

New Zealand Experience

- A study was conducted in 1999 investigating the awareness of New Zealand teachers of ethical issues involved in accessing the Internet.

- Stage One:
  - 983 (of about 2,640) primary and secondary schools questioned online.
  - 286 (28.5%) schools replied.

- Stage Two:
  - Each of the respondents in Stage One sent hard copy questionnaires.
  - 196 (70%) schools replied including 74 secondary schools (of about 340).

- Final Stage:
  - ICT coordinators/managers of 16 secondary schools interviewed
  - 65 secondary school students interviewed.

Legal and Ethical Responsibilities:
Lack of Awareness

- Awareness of the respondents was low.
  - 22% of Secondary respondents knew about the Films, Video and Publications Classifications Act 1993.
  - *"a lot of them had an idea that there was something, they didn't know much about it. They had a feeling there were some issues there, but they didn't know what they were..."*

- Ethical issues related to the Internet seldom discussed by staff.
  - 57% of Secondary respondents considered Internet censorship a moderately or extremely important issue.
  - Most of these were ICT co-ordinators.
  - Colleagues of ICT co-ordinators occasionally talked about it in the staffroom.

Legal and Ethical Responsibilities:
Lack of ownership of school Internet policy

- 82% of the respondents had developed a policy on Web use for students.

- 63% had a policy for student email use.

- 30% had a policy on staff use of the Internet.

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Legal and Ethical Responsibilities:
Lack of professional development

- Lack of awareness of ethical issues contributed to the lack of IT professional development.

- Schools spent little time on professional development.

  - *"We had it as a staff briefing at the beginning of the year...we ran a workshop at the beginning of the year for all new staff, and all staff, and that was one of the issues that was raised, as to what are our legal and moral and ethical responsibilities...we spent probably 20 minutes to half an hour on that."*

//

Legal and Ethical Responsibilities:
Lack of professional development

- Schools with professional development for Internet censorship did not offer opportunity for full teacher participation.

  Teacher: *"we had an advisor in"*

  Researcher: *"...and most people had an opportunity of participating?"*

  Teacher: *"Umm, not all of them. Only those that felt they had a need to at that stage, were in line".*

Legal and Ethical Responsibilities:
Lack of professional development

- It is sometimes difficult for teachers to 'feel the need' if they have not been informed of the issues.

  - "...we did have big trouble, at the beginning of this year, where we got [a] new computer teacher, and he's in the computer room and the kids have got easy access to the Internet. And when they weren't doing things, they'd flip into the Internet and they'd be in all sorts of places...Of course, he was a new teacher...I even had to ban somebody from using the Internet for the way they were carrying on in that class."

Legal and Ethical Responsibilities:
Lack of professional development

- Lack of full participation may lead to tension.

    - *"...the child will not have the permission slip therefore they can't access the Internet but they* [the staff] *don't feel it's wrong to sit that person next to someone* [who was] *using the Internet. And that is a worry to me because it's wrong, the parents have not given us permission for their child to look at the Internet."*

Control, control, & control

- Teachers, in general, have limited awareness of the importance of the ethical issues involved in Internet use.
  - Teachers felt their responsibility to supervise and monitor Internet use.
  - Teachers felt the need to provide a safe environment.
  - Teachers suggested they adopt a parental role.

- Principals, and ICT co-ordinators, were more aware of the importance of ethical issues and therefore encouraged tighter control for student protection.
  - 74% of Secondary respondents developed a policy for tracking students' WWW use.
  - 44% developed a policy for tracking students' email use.

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Control, control, & control
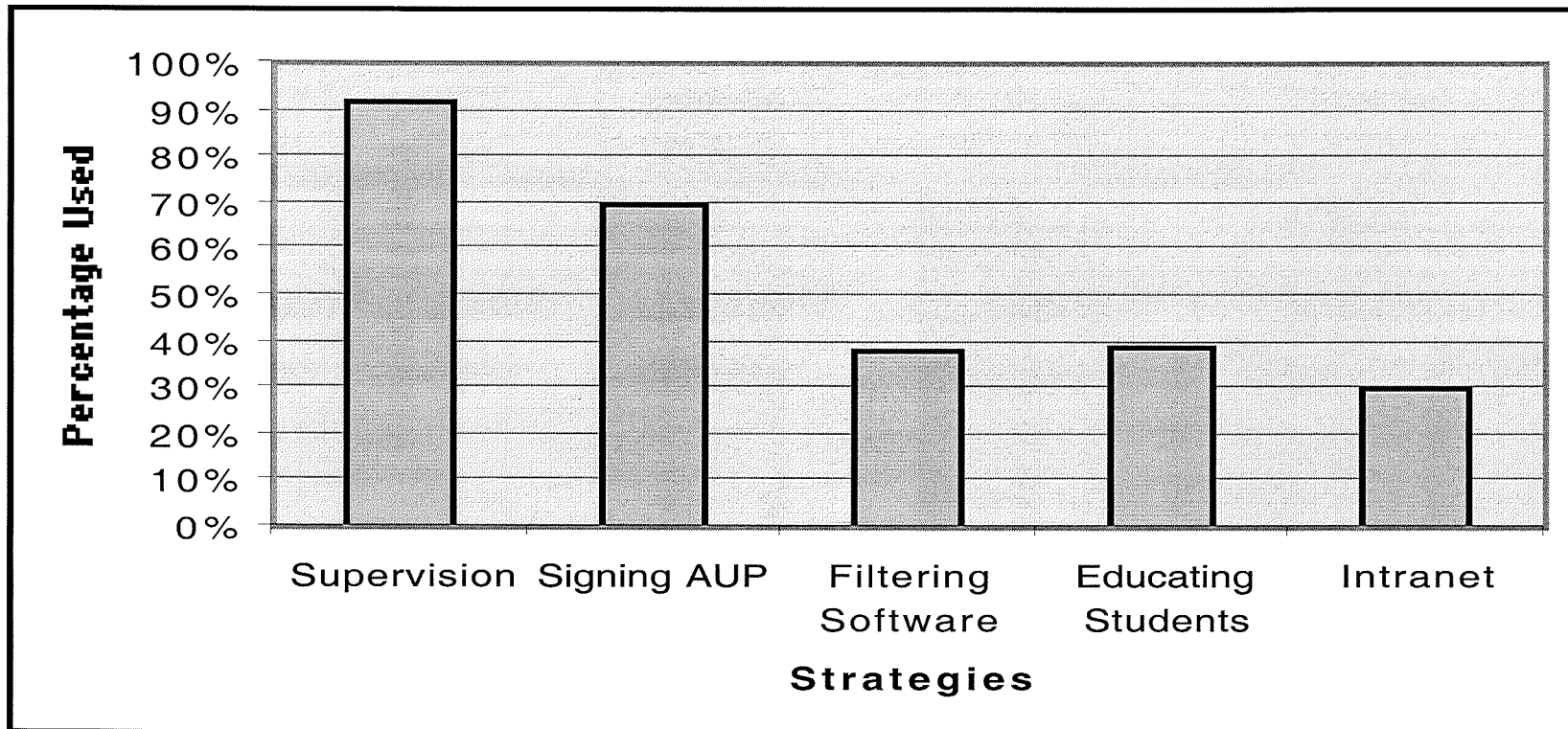
- Most schools used multiple strategies.
  - 19% solely relied on physical supervision.
  - 2 schools used AUP alone.
  - 1 school used educational strategies.

Control, control, & control:
Supervision

Tight supervision may include:

"Teachers set tasks, nominate URLs to be used and keep a watch as it is done in the PC lab."

"Use of bookmarked sites only ...Actual searching under closed supervision with discussion as to efficient key word searching first and supervision as to which sites to look at..."

Control, control, & control:
Supervision

Physical presence of the teacher:

> "*A staff member is expected to monitor the sessions by checking the screens every few minutes and advising as necessary*".

> "*Computer is in "visible" part of the room. Students can only access when staff is present.*"

Limitations of physical presence:

- Time is the big limitation.

- "*Close supervision means loss of time to do other work*" and "*not many staff* [are] *willing to supervise due to lack of time*".

Control, control, & control:
Filtering Software and Intranet

"...if we didn't have...a censorship programme with the Cyber Patrol software, that would be a big concern...[students] *do a lot of things like downloading song lyrics, downloading games, downloading zip files that they never use and its just an overhead on the system...Alright, we paid $2000 to purchase Cyber Patrol...Everyday it downloads from the United States a new set of updated rules...identify all the nasty stuff, and it goes from pornography to umm, nudism in art to racism in art to racism, hatred, violence, sex, drugs, alcohol, general substance abuse, anything unpleasant, and they create what they call these Not rules...we can look at the list of Not rules and we can tick whether we want to have...basically we tick the whole lot..."*

The Custodial Role of Teachers

- Teachers are not clear how to define objectionable materials.

- Teachers have not reflected on the implications of adopting restrictive measures on using Internet resources.
    - *"Reasonably...who decides what is appropriate? Too many value judgements involved in the absence of a policy..."*

- Constructive approach to learning is not compatible with limiting access to Internet resources.
    - *"...so much stuff out there that would be stopped by using a filter. And I don't think it teaches the children to evaluate what they're reading...we want them to decide whether it's authentic or not..."*

The Custodial Role of Teachers

- Information overloads may be prevented by teachers adopting a custodial role.

- How far should teachers' custodial role go?

- Should teachers' keep track of students email and web browsing activities?

- Will the 'custodial role' come into conflict with the 'facilitator role'?

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Conclusion

- Teachers do need to take up a custodial role.
- Many teachers are unprepared to take up this role.
- Constructivist perspective.
- Gatekeeping
  - *"Objectionable materials"*
- Lack of education about ethical responsibilities is a big concern.

- *"I do not know what I don't know. I realise this sounds ludicrous, but much of what we do is knee-jerk reaction to student problems because we have not forethought of the issue"*.

Conclusion

- Professional development and greater awareness of legal issues are needed.

- The need for cooperation with the school and the community over Internet policies was highlighted.

- Teachers need to reflect on ethical issues, as well as desirable strategies, for Internet use.

Towards DLE's

Paul Jansen, SLO

Petra Fisser, Utwente

Cees Terlouw, Utwente

the Netherlands

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V 6.2.7

Presentation

- **Secondary general education**

- **Implementation**

- **Situation**

- **Models**

- **Example**

The Netherlands

- 15.860.063, 34.329 km^2, 462/km^2

- Primary: 1.533.928p, 7238s

- Secondary: 855.835p, 666s

- Average income: ƒ 50.000/32.000

- Lack of teachers

Curriculum

- **National**
- **Tight**
- **Detailed**
- **Subject-defined**
- **Knowledge driven**
- **Overloaded**

- **5 year cycle**
- **Polder-model**

Didactical buzzwords

- **New learning**
- **Constructivism**
- **Scaffolding**
- **Student centered**
- **Learning to learn**
- **Productive learning**
- **Lifelong learning**

ICT & Education

- **Hardware**
  - School 1:10
  - Home >70%
- **Kennisnet**
- **Teacher training DRO**
- **Projects**

Now we have the hardware, the software and internet,

What to do?

Kennisnet

- Fast

- Schools, Libraries, Museums

- Digital assessment DRO

- Metadata project:
  - Thessaurus / subject
  - Evaluated URL's
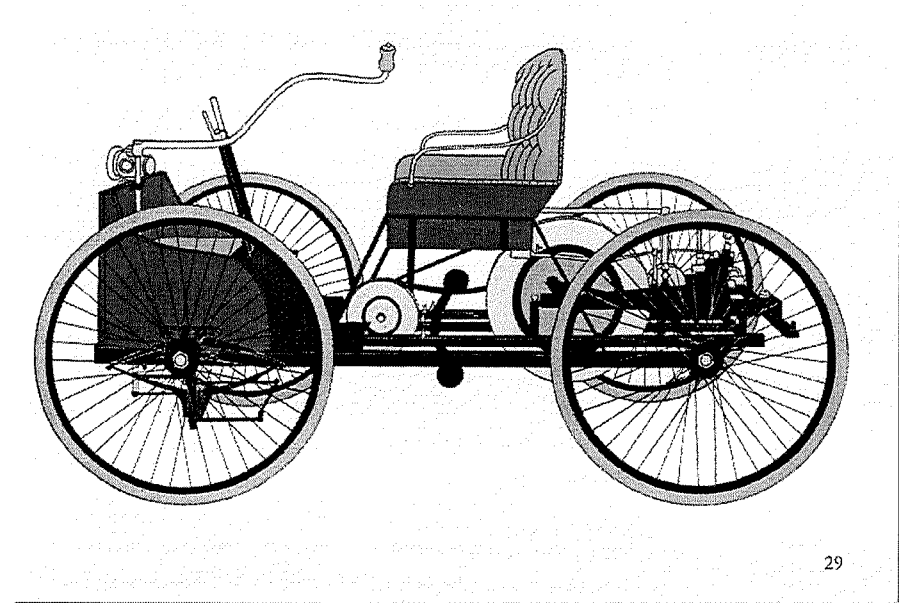
The Learning Environment

Prommitt

Innovation

Substitution

↓

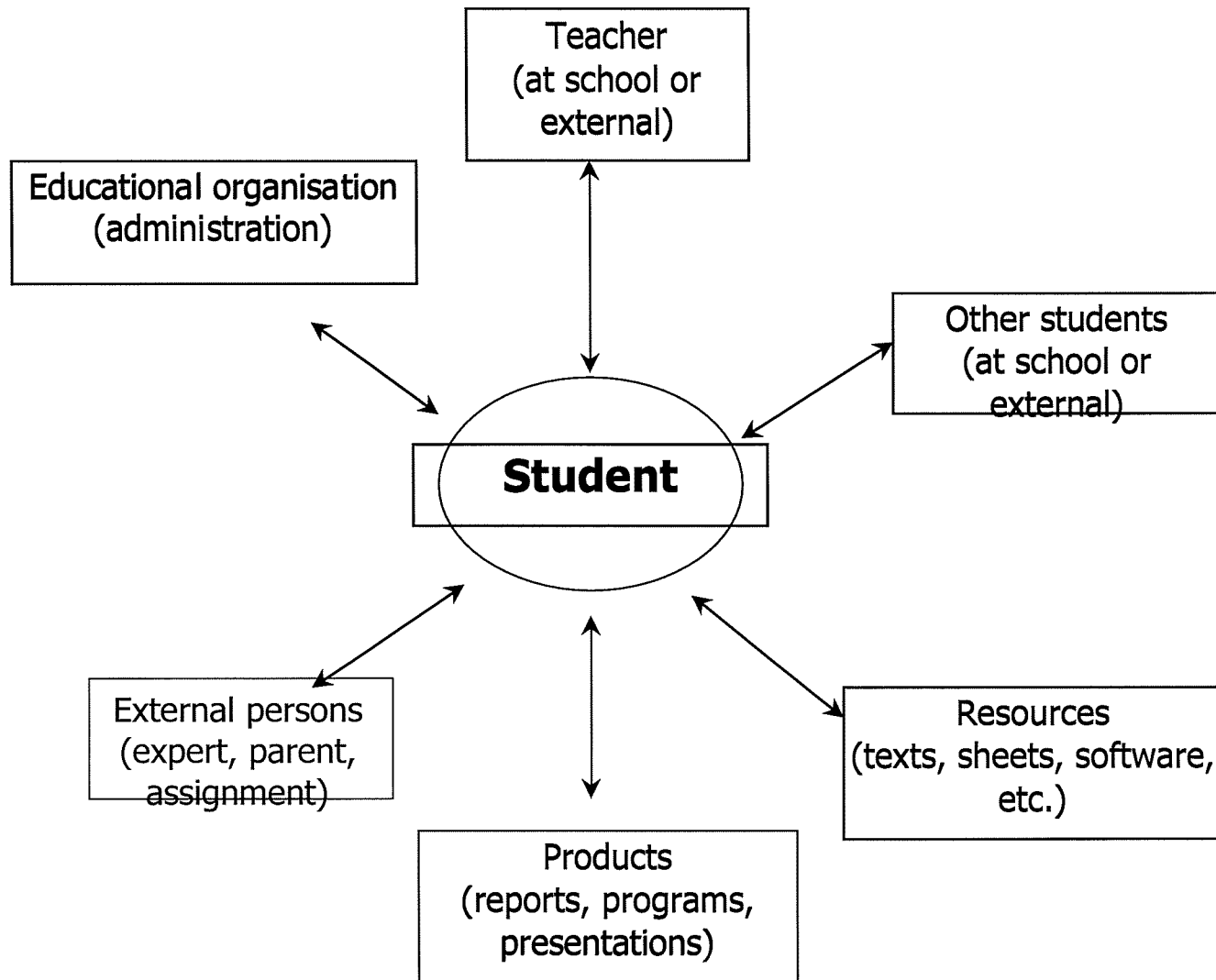## Transition

↓

Transformation

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Heading to

Interaction model

Categories ICT

- **A Communication**

  - E-mail, chat, discussion groups, videoconferencing

- **B Working on tasks**

  - Application, CAT, simulations, groupware, portfolio

- **C Information**

  - Databases, WWW, sources, publishing

- **D Administration & organisation**

- **E Curriculum changes**

Framework for ICT, student

ICT-Interaction → ↓ Educational functions	Learner / Teacher	Learner / Collegues	Learner / Sources	Learner / Products	Learner / External	Learner / Organisation	Yes/No
Preparing							
Insight in learning goals							
motivate							
Existing knowledge							
Planning							
Executing							
Oriëntation on elements of knowledge							
Oriëntation on skills and attitudes							
Exercise							
Regulating							
supervise / monitoring execution and power							
Feedback during / after practise							
Testing / Assesment							
Feedback after test							
Creating conditions							
Facilities							
Teacher oriented aspects							
Yes / No							

Selling to the teachers

- Attractive to learners
- Fits in the existing curriculum and the daily didactics and organisation
- Easy to do, no technical problems

The EES project

- Geography, research in own region, publish on Internet
- All 3d classes of all sec. schools in Enschede

EES software

- **Production**
  - Sources, formats, help, questions, thessaurus
- **Publication**
  - Site, search functions
- **Upload facility**

EES organisation

- School
- Sources, copyrights
- Experts
- Responsability & Insurance
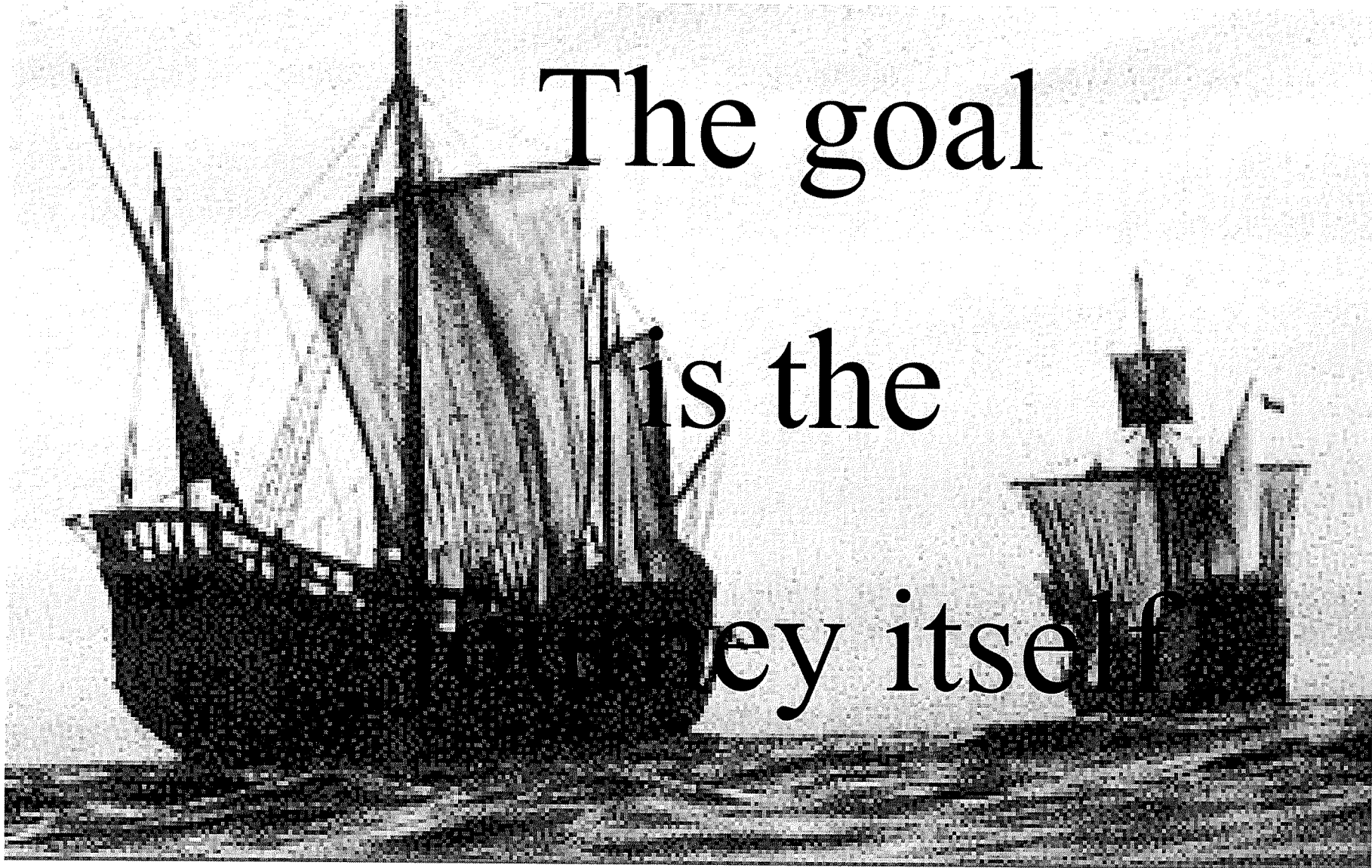- Teacher instruction
- Following years

EES benefits

- **Growing database of information for pupils, family, bussines**
- **Stimulation of integration of subjects**
- **Next step renewal**

The future starts now
The future is uncertain

Columbus

management

The goal

is the

ey itself