

Documetation

on use of the Web-service

<http://UNESCO-SEMINAR.ARTSTYLE.NET>

The main sections

The Web-service consists of several information and communication sections:

Open section:

**ABOUT SEMINAR
TIMETABLE
PARTICIPANTS
MATERIALS
DIRECTION
CONTACTS**

Closed section:



**PAPER DISCUSSION
FORUM
MAILING LIST**

In order to receive access to the closed section of the Web-service a visitor must receive an authorization by entering the login and the password given by the administrator of the Web-site.

The main services

The succession of work with the Web-service

1. Registration

In order to register oneself and to become an authorized participant of the Web-service you should do:

- a. Visit the site <http://unesco-seminar.artstyle.net/>
- b. Click the reference "Register" at the right top corner and fill in the "Application for registration"
- c. After filling in all the fields click the button "Request", the administrator of the Web-service will receive a notification about a new application, he will process it and will give the user the login and the password.
- d. You can receive the login and the password without registration. You just have to get in touch with the administration of the Web-service using any means indicated in the section CONTACTS.

- b. To send the messages enter the section MAILING LIST, introduce new information, select the recipient from the list of participants (to select several recipients hold the SHIFT button) and click SEND button.
- c. To send the email to the group of participants select one or more titles: MODERATORS (TUTORS), PARTICIPANTS, IITE.

8. WEB-SERVICE ADMINISTRATOR ABILITIES

- a. WEB-service administrator may add the participants to the list, edit information on the participants, create the login and password, remove the participants from the list.
- b. To add a new participant the administrator should:
 - i. authorize with the Login: root, Password: root,
 - ii. enter the section PARTICIPANTS,
 - iii. select the participant who needs login and password,
 - iv. click "edit this record" in the right top corner,
 - v. enter any login and password in the first two areas,
 - vi. notify the participant by e-mail or post that he is authorized and mention his login and password.

De : Azat Khannanov <Azat.Khannanov@iite.ru>

À : <morel@uni2a.unige.ch>

Date : Jeudi, 17 mai 2001 16:26

Objet : Login and password for IITE website seminar section

Dear Prof. Morel,

please use the following for the entering the working area of the website seminar section:

login: morel

password: Morel

Thank you for co-operation,

Sincerely yours,
Azat Khannanov
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UNESCO Institute for Information
Technologies in Education (IITE)
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Summary-Advance Organizers

- ICT is producing changes in social-educational areas and it facilitates crimes
- Meaning and role of ethics.
- Ethical issues demanding principles for ICT policy making

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ICT and Social Change

1. ICT will (is) radically changing the social structures (telematics, telecommuting, tele-medicine, tele-education, virtual peers, virtual communities, recreation)
2. Social behaviors and social interaction too will be changed
3. Moral code, social conduct, rights and responsibilities will also be changed

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ICT and Changes in Education

1. Individualization: Study is entering in individual families
2. Socialization: Scale of learning is enlarged
3. Life-span-ness: People study through out their lives
4. Structural Diversity: Virtual, distance, and conventional education complement each other
5. Information ownership: Information owners are becoming power owners
6. Modernization: Combination of education and technology has synchronized tightly
7. Internationalization: International cooperation in education is spreading

Kurming, Q & Guobin U (1996) "New Information Technology and Teachers" Education and Informatics Proceedings of the Second International UNESCO Congress Moscow: UNESCO

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Cyber Crime is Increasing

1. Cyber Crime is increasing (in many spheres)
2. Impact of these crimes has greater magnitude
3. We are hearing different types of crime stories (about the ill effects upon / (by) the 'Computer Whiz Kids')
Whiz Kids)
4. Laws cannot chain these kids
5. Taming these kids (intellectually superior) may require new treatments through ethics

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Levels of Crime-Immorality

1. Idea-level crimes
2. Feeling-level crimes
3. Sense-level crimes
4. Body-level crimes/ actions...

we may solve the probe at fundamental level

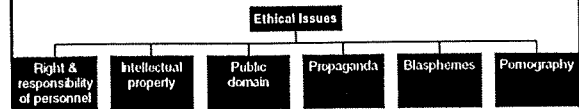
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Pedagogical Approaches for Ethics

- Behaviorism
- Cognitive
- Constructivism

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Aspects of Ethical Issues (Fig)



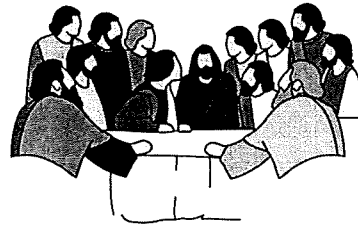
14

ICT Related People-Around Learners

1. The 'rights and responsibilities' of teachers, learners, policy-makers, law-makers, local community, and parents should facilitate the growth in an affordable, just, and happy environment
2. The 'rights and responsibilities' of peers, virtual peers, servers

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Rights and Responsibilities of Teacher, Learner, Policy-Maker, Law-Maker, Local Community, and Parents



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Rights and Responsibilities of Others

1. Responsibilities of relevant people (exhibiting accountable behaviors) towards the welfare of learners
2. Rights of relevant people exhibiting controls over the behaviors of learners(in an ICT environment)

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Rights and Responsibilities of Learners

1. Rights of learners of ICT environment towards others
2. Responsibilities of learners of ICT environment towards others

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Parents Responsibilities Towards Schools

1. Share relevant information about your child's education and development Ask for clarification that is unclear to you Make sure you understand the ICT program Monitor your child's progress
2. Keep records

25

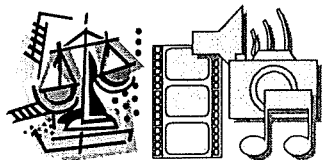
Local Community and Schools

1. Local community- interactive participation should help to overcome the ill-effects of social and economic inequalities
2. So that the greatest benefit for the least advantaged are strived at

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Intellectual Property



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Intellectual Property-Meaning

1. Meaning- issue of using someone's property or writings without permission
2. Misuse of software too is unethical + often illegal
3. Pirated software, hacked accounts, stolen passwords are illustrative examples
4. Many people use unethical means to extract the maximum potential from their computers- check such means
5. How do we deal with this problem?

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Intellectual Property-Legal Measures

1. Legal approach for ICT can help to catch those who actually get noticed by the law-enforcing agencies. But what about the un-noticed ones?
2. Approach of developing moral values will help in saving countless people from the guilt of using unethical means Can we try some cognitive models for ethics?
3. The question is whether legal laws will be more effective in countering the bad prevalent practices

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Intellectual Property-Ethical Measures

1. We are looking into two faces of the same coin. Each face has its own independent existence and yet, it finds deep roots in its twin-ness.
2. One seeks legal options when moral options fail. One talk of moral approach when legal one fails.
3. However, ethical values will have longer-stronger foothold in any society

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Blasphemes

(To treat disrespectfully through words or action)

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Blasphemes-Verify Identity

1. It is difficult enough to verify someone's identity in the tangible world where forgery, impersonation and credit card fraud are everyday problems of authentication
2. Such problems become grave with the shift from face-to-face interaction, to the faceless interaction of cyberspace

How do we take care of this problem?

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Pornography

Pornography is the abusive use of exciting sex materials- print, audio, and video forms

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Pornography

1. Adolescents are the major victims
2. Many teachers and parents are worried of this onslaught
3. Commercial people are creating many hate-love web sites, murders sites

What is our responsibility to protect against the misuse of ICT

Ethics for providers and seekers

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Policy Principles

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Policy Principles- Claim Compensation

1. An individual has the right to claim compensation for the damage and any associated distress arising from the loss or unauthorized destruction or disclosure of personal data relating to him or her, or arising from the inaccuracy of such data
2. The information to be contained in personal data are to be obtained, and personal data are processed, fairly and lawfully
3. Social and economic inequalities [regarding] are to be managed in such a way so that (a) greatest benefit is available to the least advantaged, and (b) these measures are attached to offices and places open to all under conditions of fair equality of opportunity

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11 TE Memo
HOTTE

Towards Problems and Policy Issues of Integrating ICT in Education

ETHICAL ISSUES **(Unit D3-1)**

Chair Mr. Mike Aston
Initiator Prof. B.K.Passi
Reactor Prof. Cornu Bernard

Initiator Prof. B.K.Passi

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ETHICAL ISSUES

Dr.B.K.Passi¹

1.0 Background

Technology is a powerful means of managing and controlling the society. It is a double-edged tool. It can be used and misused by the Providers and the Users in any direction and to any extent. If used properly, the technology can become more egalitarian and democratic. In case it is misused, it can become a tool of systematic abuse of human rights. In the area of ethics of technology, there are ‘policy vacuums’. If delayed in our actions of policy formulations, a country may reach a point of ‘no-returns’.

The traditional styles of educational management may fail to harness the benefits of technology for the Users. The ‘insensitive Providers of education’ may continue to speed up the on-slaught of an oppressive system of education. The approach of legal solutions is too simplistic. We may need to develop ‘ethical guidelines’ for learners, teachers, administrators, parents and others.

2.0 The Principles

1. **Social justice:** The social and economic inequalities are to be managed in such a way so that (a) the greatest benefit is available to the least advantaged, and (b) these facilities are attached to offices and places ‘open to all’ under conditions of fair equality of opportunity for their use.

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2. **Personal data:** The information and the personal data are to be obtained, processed, and used fairly and lawfully. An individual has the right to claim compensation for the damage and any associated distress arising from the loss, or unauthorized destruction, or disclosure of personal data relating to him or her, or arising from the inaccuracy of such data.
3. **Respect the privacy of others.** An accession to other's data and information without permission must be strictly avoided.
4. **Security measures:** Appropriate security measures should be taken against unauthorized access to, or alteration, disclosure or destruction of personal data and against accidental loss or destruction of personal data.
5. **No discrimination:** Care should be taken to avoid the acts that show the discrimination of gender, races, nations, etc.
6. **Honor intellectual property:** The people should not bring or copy an intellectual property without permission from the owner.
7. **Copyright:** It is a criminal offense to copy any software that is protected by the copyright. We should encourage the use of licensed software in a manner consistent with the licensing arrangement.
8. **Tampering:** Do not tamper with switch settings, move, reconfigure or deliberately damage terminals, computers, printers or other equipment. Do not knowingly cause a system to crash
9. **Avoid Offensive Messages:** Do not use a computer to annoy others, including, but not limited to, sending offensive messages.

3.0 Materials for Presentation

While keeping in view these principles, the slide-presentations are prepared for fulfilling the following objectives.

- a) The participants will be able to identify the rights and responsibilities of different functionaries and users of education.
- b) The participants will be able to draw the country-guidelines for ethical use of ICT in education.
- c) The participants will be able to understand the principles of human rights leading to draw the guidelines for equality and free access to IT for all.

The scope of this slide-presentation covers the following aspects of technology such as:

- a) Rights and responsibilities of teacher, learner, policy-maker, law-maker, local community, parents
- b) Intellectual property
- c) Public domain
- d) Propaganda
- e) Blasphemes
- f) Pornography

Insert Slides of ethical issues

4.0 Reactions and Discussion

After the slide-presentation, the reactor, Professor Bernard Cornu made Formal Reactions to the topic. These reactions did help to see a new viewpoint regarding the topic.

Reactions from Prof. Bernard Cornu

In the second part of the discussion, the Chairperson invited different participants for giving their reactions, clarifications, and other comments. The participants appreciated the relevance of each issue for their respective countries. They deliberated upon the questions, ‘How do we resolve the conflicting issues of “freedom of expression and social controls”, “globalization-localization of knowledge”, and “freedom and propagation” through legal policy frames in the respective countries? They also asked questions about anonymity, threats, pornography, blasphemes, cheating, and piracies. How do we ensure a fair play for all these issues in our country-policies of ICT? The discussions addressed at issues from the global and country perspectives. The Chairman summarized by saying that the ethical issues should become the core consideration for policy formulation for introducing ICT in education.

EDUCATION AND SUSTAINABLE DEVELOPMENT [D1-2]

Comments and Reactions
by
Reactor
Dr.B.K.Passi

Initiator
Mr. Mike Aston

Chair
Prof. Bernard Cornu

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EDUCATION AND SUSTAINABLE DEVELOPMENT [D1-2]

Comments and Reactions
by
Reactor Dr.B.K.Passi¹

1.0 Reactions for the Theme

1. The Reactor presented his views related to two concepts 1) idea of development and 2) idea of education. The idea of education was expressed in terms of changing 'objectives', 'philosophies' and 'approaches' to education. Firstly, the objectives were viewed in terms of 'Four Pillars of Education- Learning to know, Learning to do, Learning to live together, and Learning to be'. Of course, we may also consider the fifth beam of education like 'learning to do things differently' as we are living in a creative society. Secondly, the idea of philosophy of education was considered from the points of view of four schools of thought like 1) Idealism (seen as product where ideas are absolute and real), 2) Naturalism (seen as product where matter is absolute and real), 3) Pragmatism (seen as a process where social good is decisive), and 4) Existentialism (seen as a process where an individual is decisive). Thirdly, the idea of approaches to education was discussed in terms of Behaviorism, Cognitivism, and Constructivism. The salient analysis about constructivism was highlighted as below.
2. The 'pedagogy of constructivism' believes that individuals learn by resolving cognitive conflicts through experiences and reflection. The process of metacognition employs the critical thinking skills for

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interpreting the experiences and undertaking reflections. The educators of 21st century should encourage confrontation with events, experiences, assumptions, and conclusions with a critical view of challenging the status quo and creating alternate perspectives for designing new solutions.

3. The constructivists believe that all the children can think in depth. The critical thinking and depth thinking will create new meanings to basic concepts that can be transferred and applied to life situations. Direct experiences with real problems are essential for developing critical thinking that emerges out of the process of solving puzzling events, discrepancies, and anomalies.
- 4.
5. The critical and creative teacher will present problems related to the normative and scientific issues and then seek the views of students. Some of those problems could be like 'how to keep healthy' or "how do you greet the strangers". The students would give answers that might be diverse. The teacher treats all the answers as fully acceptable and then elicits the reasons for the responses. The students are made to look critically at the underlying assumptions. The close examination helps to know that 'reality is multiple' and is actively constructed. This method is in opposition to the methodology of behavioral approach that is generally followed in the formal systems.
6. The new teachers equipped with the ICT have to learn to pose problems and not provide answers. This presupposes a thoughtful analysis of 'how of the child' and 'how of the classrooms' that will further help to create the process of uncovering and constructing the concepts. This analysis will focus on the puzzling task, frames of reference, underlying assumptions, data used, citing evidence, giving interpretations, and finally working out consequences.

2.0 Concept of Development

7. While examining the second aspect of the theme, the Reactor presented two views regarding the concept of development that would cover the cultural development and economic development. These views are formulated from the position taken by the Report of the World Commission on Culture and Development.

8. The issue of economic development divorced from its cultural context was the focal point of the comments. The two views of development are interrelated and can be interdependent. The economic development in its full form will become a part of the culture of the people and that of the broad idea of human happiness.
9. Of course, we need not stick to the view that economic development will necessarily 'help or hinder' the human culture. The presenter advanced the argument by maintaining that the concept of development embraces not only access to goods and services, but also the opportunity to choose a full, satisfying, valuable and valued way of living together, the flourishing of human existence in all its forms and as a whole. Even the goods and services stressed by the narrower, conventional view are valued because they contribute to our freedom to live the way we value.
10. How can we communicate the view that cultural development cannot be treated as a sub-component or /factor for the economic development? The Reactor emphasized that 'the culture' cannot be reduced to a subsidiary position as a mere promoter of economic growth. Culture's role is not exhausted as a servant of ends. Cultural development is an "end" in itself. Of course, the development and the economy are part of a people's culture.
11. The environment for human culture, including educational environment, is unlimited in its diversity and scope. 'Unlike the physical environment, where we dare not improve on the best that nature provides, culture is the fountain of our progress and creativity'. Once we agree to this view the ICT based education shall have to provide the best of the opportunities in multiple forms for human-development.
12. People and the volunteer groups have to play their role for the formation of the views as given above. The informal, nonformal and formal systems of education have to coordinate their programs. We know that informal education will play the most significant role. We may appreciate the reality that people decide the contents and the format of the cultural development. The governments cannot be proactive in this role. But they can support the people. In fully developed cultures, the values in their plurality are respected and

encouraged for their creative diversity. The Reactor quoted from the above Report, 'Policy-makers cannot legislate respect, nor can they coerce people to behave respectfully. But they can enshrine cultural freedom as one of the pillars on which the state is founded'.

13. Cultural freedom ensures the freedom for the groups and the freedom of the individual in the groups. Cultural freedom encourages experimentation, diversity, imagination and creativity. We must ensure that no one is allowed to trample the culture of different people. The educational institutions at all levels must ensure an environment of freedom and respect. The symbols, the religion, the values, the food, the songs, the dance, the music, the rituals, and the institutions of culture will have to be given their due status and will have to be integrated in all its forms of life including that of the economic ones. The language and ICT in all forms of education will have to play active roles in this venture.

ITE

Mono
Home

Towards Problems and Policy Issues of Integrating ICT in Education

TECHNOLOGICAL ISSUES

(Unit D2-1)

Chair Prof. Cornu Bernard

Initiator Prof. B.K.Passi

Reactor Mr. Mike Aston

Initiator Prof. B.K.Passi

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TECHNOLOGICAL ISSUES

Prof.B.K.Passi¹

1.0 Background

The technology is revolutionizing all aspects of life of the information society. A new kind of economy is emerging. The information-capabilities of the new society are pervasive, making it substantially different from industrial and agricultural societies. In response to these changes, the education will be transformed especially while integrating the ICT in its fold.

- The new tool of ICT will influence and create new structural transformations. The educational institutions will be transformed in terms of their objectives, clientele of learners, teacher-profiles, teaching-learning-evaluating principles, and the management of support systems.
- Encourage the technology providing increased opportunity and the ability to break down the barriers of time, distance, age, and ability through the use of two-way interactive communication.
- Technology should facilitate ‘anywhere, anytime, anyway, any pace’ learning. The learning day can be extended, the learning audience can be expanded, and home to school communication can be enhanced.
- The nature of knowledge in terms of its present disciplinary organizations will be transformed on a continuing basis. The users of knowledge will become the creators of knowledge. The poverty/wealth will be defined in terms of knowledge constructing capabilities.
- Technology may help nations to skip over some developmental stages by following quantum jumps. The speed of this engine of development will depend upon the availability of technology, hardware and software, profile of manpower, and the technology-policies.

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2.0 The Principles

The policy-framers and decision-makers are captains for guiding the ships for future destinies. The creation of a meaningful dialogue amongst these persons is mutually useful. The participants looked into different scenarios of emerging technologies. The rationale of this dialogue lies in the enunciated principles, as given below.

1. **Technology production, purchase and transfer:** Purchase and distribution of technology and software can create unhealthy competition among nations, regions, schools and other stakeholders. Local and global measures should be taken to check and counter balance the dangers of this possibility.
2. **Computers and other peripheral machines:** Production and supply of computers and peripherals will continue to improve in their capacity, cost and available quantity. The first rate machines will never be available to all the potential users, in the first go. We have to accept the principle of progressive and gradual development, as far as equality is concerned. Alternatively, new supporting policy measures have to be designed at country levels.
3. **Satellites:** The production, maintenance and utilization of communication satellites by the big and powerful nations do have an edge over small and weaker nations. While formulating the strategies for purchase, hiring, and use of satellites, the cooperative policies should be formulated with the underpinning of 'give and take' between the nations.
4. **Software:** Development of software is an ever-increasing area of work. Software will require continuous up-gradation and maintenance. The improvement of machines and the escalating demands for new computer-functions will increase conditions of software production. The ever-increasing demand for this manpower across wide spread areas will require skillful handling. The demand of equal facility at equal costs needs to be applied with care and caution.
5. **Bandwidth:** The diversity of bandwidth of Internet is discriminatory against the 'have-nots' and the 'late starters'. The gradual progress of technology versus the sudden introduction of broadband will ask for supporting economy, mass production, and appropriate skill-development amongst the users. International and national policies will have to be formulated to meet these challenges.

6. **Technology divide:** Technology should be available to all the learners of all the nations irrespective of age, sex, religion, language, and region. The technology should be available free or at affordable costs. The present technology divide between ‘haves and have-nots’ should be bridged through appropriate policies and compensatory economic measures.
7. **Poverty eradication and talent development:** Technology should be used to solve the problems of poverty eradication and development of talent. Educating individuals about the types of societies and communities we want to build should be the foundation of technology education.
8. **Curricular areas:** The two trends, viz., ‘technology-push’ and ‘pedagogical-pulls’ has not gone hand in hand. There is an urgent need of undertaking researches to articulate the demands of pedagogical requirements. Research should identify the types of technology and software for different curricular areas like sciences, social sciences, languages, and others.
9. **Specialized technology for varying profiles of users:** The specialized technology for specialized functions required for teaching and learning will have to be tailor-made for different types of learners. Researchers have to conceive and articulate their demands for persons of varying capacities and styles of learning. Along with the needs of the learners, technology policies for facilitating the work of teachers and parents will have to be researched upon with equal emphasis.
10. **Integration of ICT:** Integration of ICT in education will not take place automatically. It will require special support to develop interaction among researchers, consultants, professional teachers and students for maturing special cognitive tools for curriculum and teacher training.
11. **Technology phobia:** The technology must be robust and simple so as to create not only a user-friendly environment but also user-modifying environment by designing new tools that will create excitement for technology rather than the ever-growing technology-phobias. Ongoing professional development for teachers, parents, and community members should enhance the use of technology-based resources to their fullest potential.
12. **Research:** Technology should facilitate research that would use world as a ‘laboratory both for communication and interaction’ via electronic e-mail, fax-machine, and video conferencing. Accept the significance of researching, developing, selling and marketing

information technologies. Technology must be recognized as an evolving process. Technological growth should be provided with continuous, recurring attention and resources.

13. **Pedagogy-driven technology:** We need to create pedagogy-driven technology policies rather than technology-driven policies of pedagogy. The international bodies, national governments, and civil societies will have to play a major role in checking this trend of market forces.
14. **Integrating Technologies:** Technologies, which are helping to integrate learning across subjects, age groups, learning styles, medium of interactions and abilities, should be supported.

3.0 Materials for Presentation

While keeping in view these principles, the slide-presentations are prepared for fulfilling the following objectives.

- a) To understand the increasing needs of integrating technology in education.
- b) To create awareness about the ICT and the technical understanding about the 'problems and issues' of this technology- 'hardware selection, procuring, maintenance' - in the respective countries.
- c) To understand the social implications of the hardware (especially for the basic human values), and problem of widening-gulf between the 'have and have-nots'.

The scope of this slide-presentation covers the following aspects of technology such as:

- a) Telephone network
- b) Power supply
- c) Machines
- d) Maintenance/technical support
- e) Networking/satellite
- f) Internet

<p style="text-align: center;">Insert Slides of Technological Issues</p>
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4.0 Reactions and Discussion

After the slide-presentation, the Chairperson invited Mr. Mike Aston to make Formal Reactions to the topic. This reaction did help to see other viewpoints of the topic. In the second part of the discussion, the Chairperson invited different participants for giving their reactions, clarifications, and other comments.

Comments of the Reactor Mike Aston

While keeping in view the requirements of their countries, the participants asked a few questions related to the status position of computers in four types of countries like, ‘technology-emerging’, ‘technology-applying’, ‘technology-integrating’, and ‘technology-transforming’. The initiator and other members of the group provided the responses. Each of the participants saw the relevance of the deliberations for his/her own country. The discussions led to the considerations for a worldwide analysis of the issues of technology. The group considered questions like, ‘What technology-profile is useful for introducing ICT in a country when examined from the point of view of cost, availability, suitability and the maintenance?’ ‘What precautions and guidelines should we follow while procuring and installing technology in our education systems?’

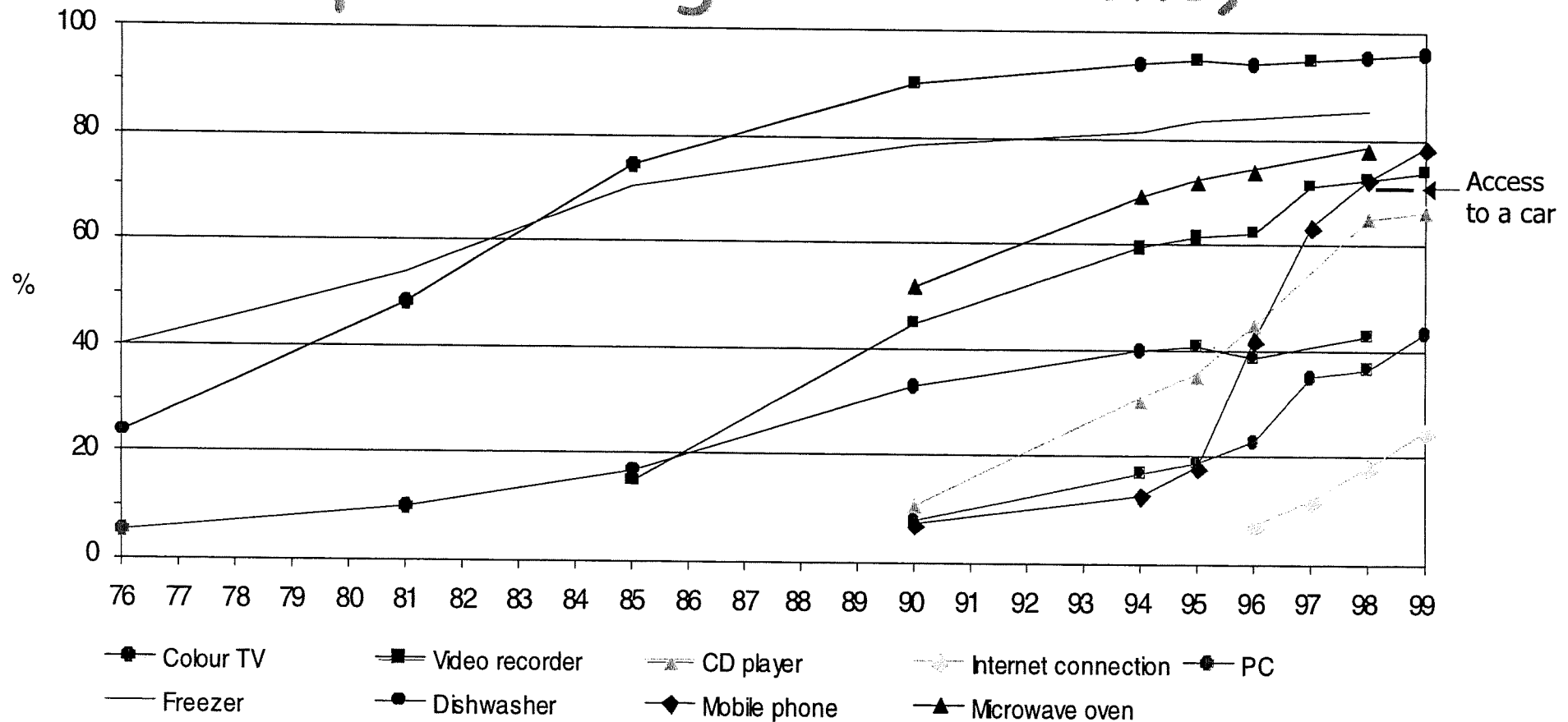
The Chairman summarized the discussion by saying that international coordination and co-operation should take place at different levels. The participating countries may like to harmonize their national laws for resolving jurisdictional conflicts and differences, if any.

Applied "Morel's matrix"

Criteria / Phase	Emerging	Applying	Integrating	Transforming
Context				
Pedagogy				
Vision				
Coverage of ICT strategy				
Curriculum				
Resources				
Staff development				
Quality assurance				

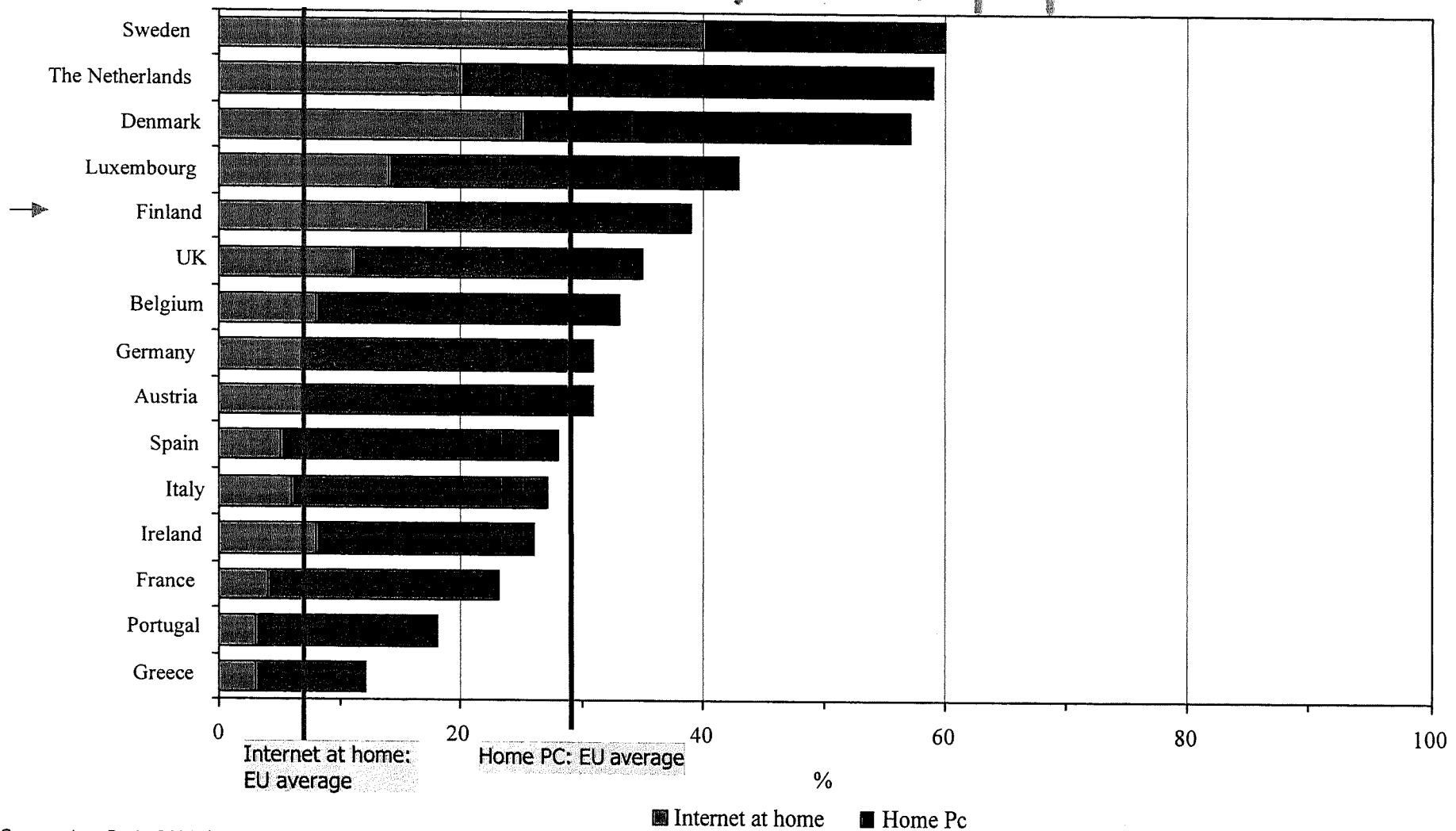
If you want, you can fill the grid and place countries (B, N, F, E) in appropriate slots and tick (X) your own country as well.

Spread of certain devices in Finland up to late 1999 (% of households possessing at least one)

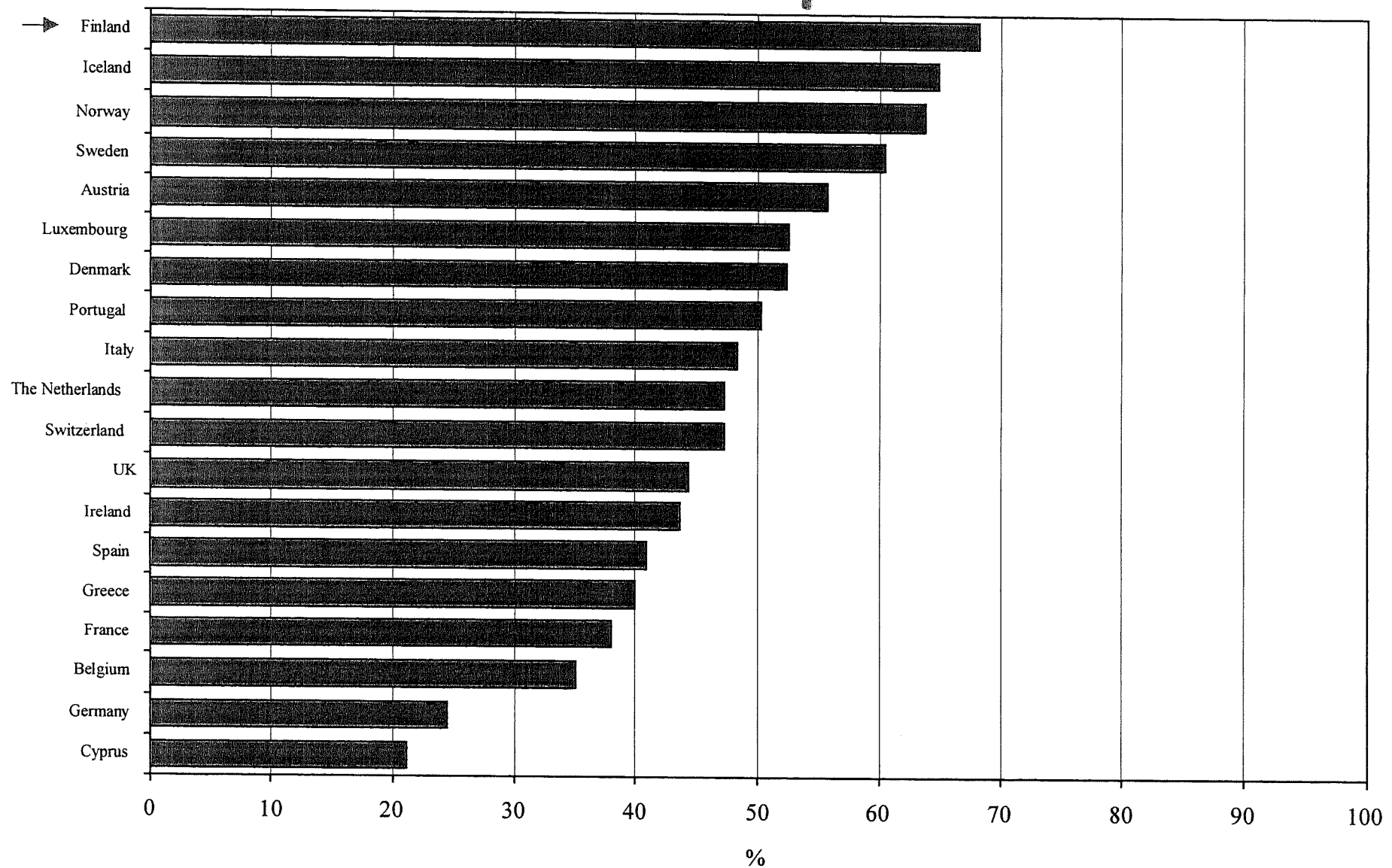


Source: Household Budget Survey and Consumer Survey, Statistics Finland

Persons aged 15+ with a PC and Internet connection at home in different European countries in 1998, % of population



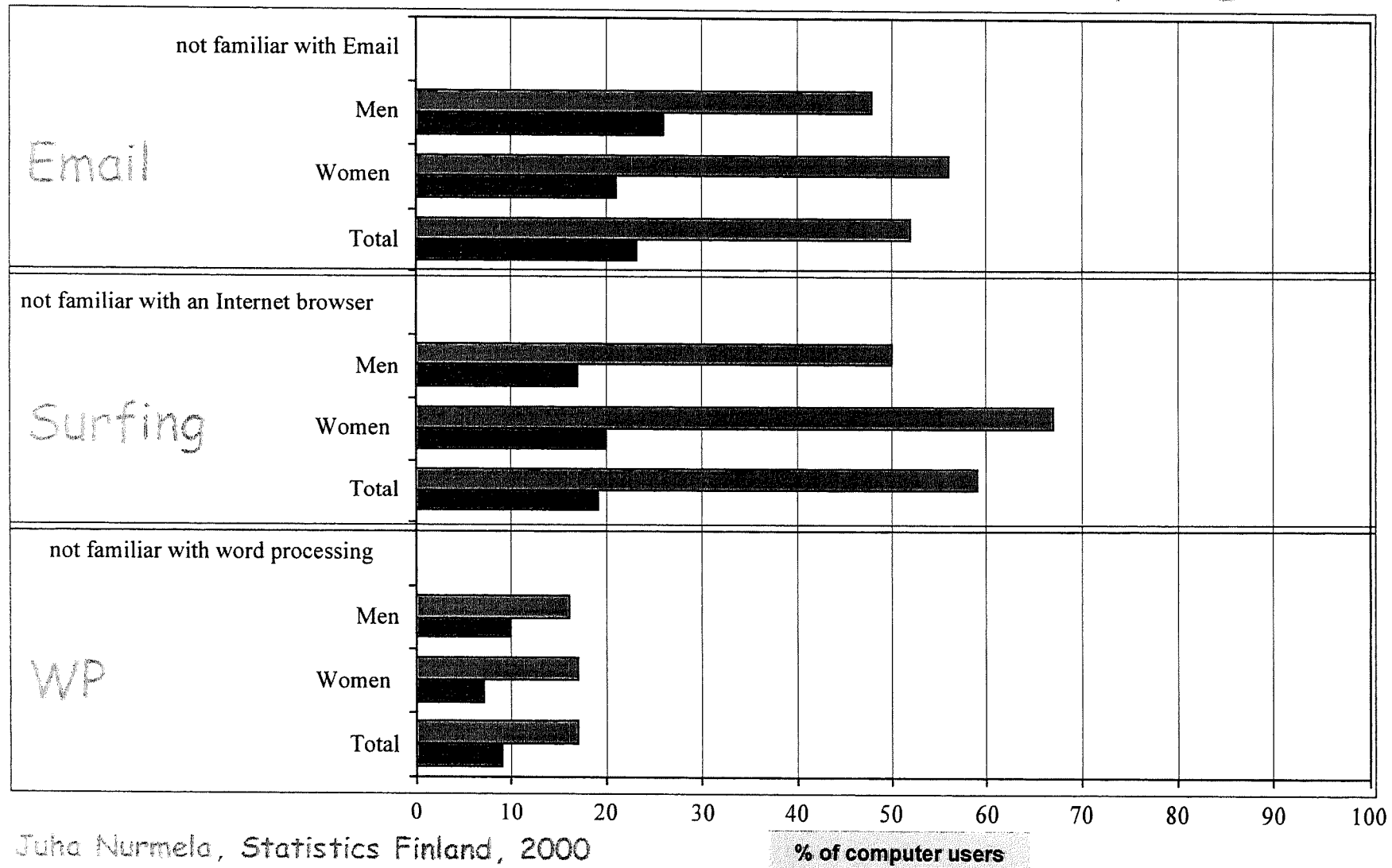
Number of mobile phones / 100



Source: Lea Parjo 2000 / Mobile Communications

■ 1.3.2000

Improvement of computer and Internet skills among Finnish users between 1996 and 1999 by sex, as % unable to use the programs



What ICT has replaced

(among those pupils who use PC over 5 h/week)

- watching tv 38 %
- unspecified loafing 36 %
- out-door activities 33 %
- reading 29 %
- school homework 26 %
- work at home 25 %
- being with the family 24 %
- talking over the telephone 14 %
- seeing friends 8 %

ICT and social exclusion (the digital divide)

Haves

young

male

wealthy

southern & urban

well-educated

technology & science-
oriented

Have-nots

elderly

female

low-income

unemployed

living in remote areas

non-academic

humanities-oriented

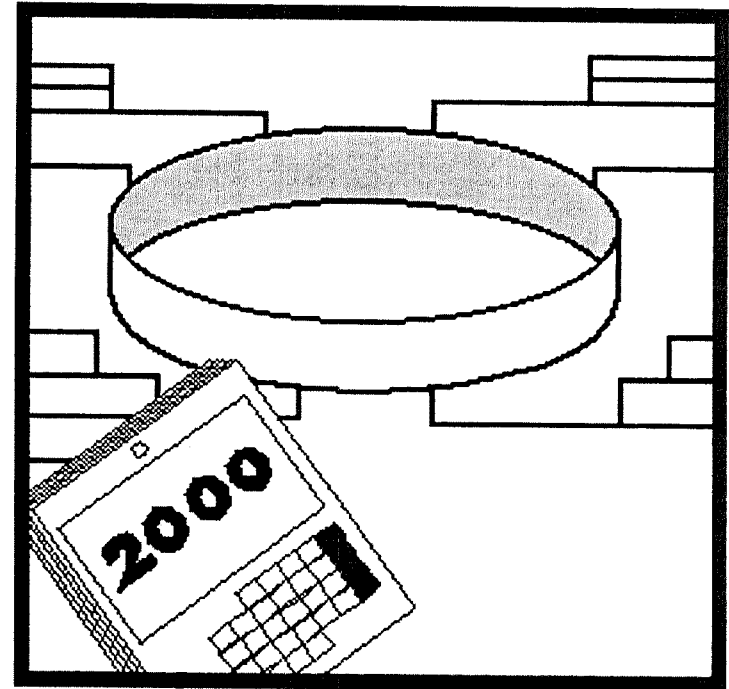
Home computers of HE students in Finland (1998)

Computer at home (%)	University students		Polytechnic students	
	Male	Female	Male	Female
None	23.1	29.5	14.3	38.6
Yes, but no network connection	39.4	49.8	58.6	47.3
Yes, with network connection	37.5	20.7	27.1	14.1
Total	100.0	100.0	100.0	100.0

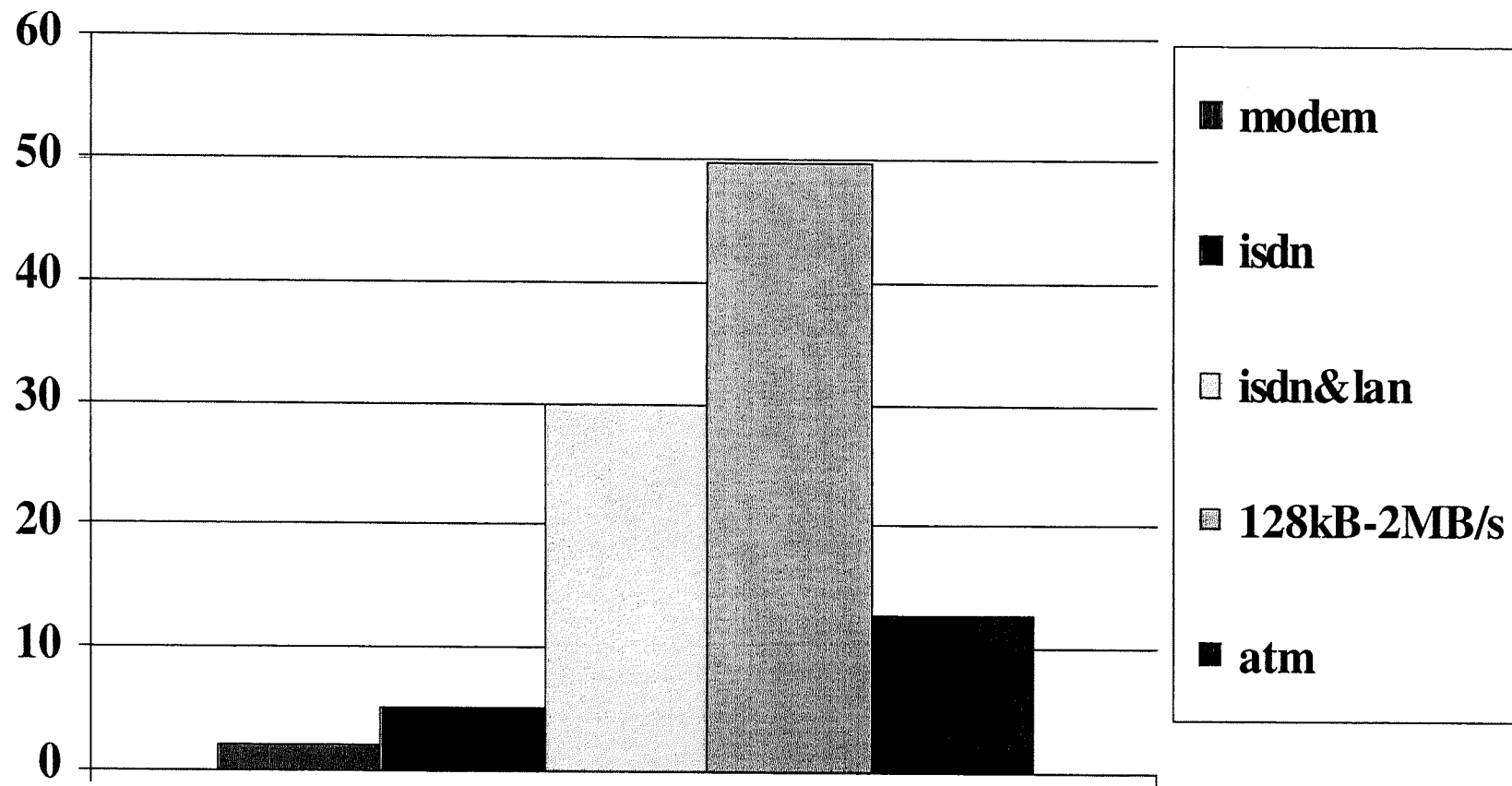
ALL SCHOOLS TO INTERNET

(Situation in 1999)

- ♦ primary 90 %
- ♦ lower secondary 90 %
- ♦ upper secondary 95 %
- ♦ vocational 100 %



Bandwidth of Internet access from schools



Students per Computer

Level	Students per PC 1999	2000
Primary	12-13	10-12
Lower secondary	11-12	8-10
Upper secondary	9-10	6-8
Vocational	5-6	5
HE	2-50	n.a.

Obstacles to the use of information technology according to university administrators

Obstacles to use	Mean
Teachers' lack of time	4.1
Teachers' ICT skills	4.1
Lack of pedagogical support	4.0
Lack of technical support	3.9
Teachers' reserved attitudes	3.7
Student workstations	3.4

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

Obstacles to the use of information technology according to university teachers

Obstacles to use	Mean
Teachers' lack of time	3.7
Lack of pedagogical supports	3.6
Teachers' ICT pedagogical skills	3.6
Teachers' ICT skills	3.6
Lack of technical support	3.3

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

Obstacles to the use of information technology according to university students

Obstacles to use	Mean
Student workstations	3.5
Students' lack of time	3.4
Students' ICT skills	3.1
Course overlap	3.1
Insufficient course hours	3.0
Teachers' lack of time	3.0

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

Knowledge and skills of Teachers

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

Basic ICT skills of teachers and students in Finnish HE in 1998

Type	Universities		Polytechnics	
	Teachers	Students	Teachers	Students
A. BASIC SKILLS AND TOOLS				
Word processing	4.3	4.0	4.1	4.2
Operating systems	4.0	3.6	4.1	3.9
WWW browsing	3.9	3.8	3.9	4.1
Drawing/Image processing	2.8	2.8	2.8	3.2
Spreadsheets	2.8	2.8	3.2	3.4
Database programs	2.5	2.2	2.5	2.7
B. COMMUNICATION AND TEAMWORK				
E-mail	4.2	4.0	4.3	4.1
Presentation graphics	2.6	2.2	2.9	2.6
Videoconferencing	1.8	1.4	2.2	1.6
Teamwork applications	1.7	1.5	2.0	1.8
C. ELECTRONIC LEARNING MATERIALS				
CD-ROM materials	3.2	2.8	3.1	3.0
WWW as learning resource	3.0	3.0	3.1	3.5
CAL programs	2.6	2.0	2.7	2.2
Online help	2.3	2.4	-	-
Producing WWW material	2.2	2.0	-	-
D. SPECIFIC PROFESSIONAL APPLICATIONS				
Games	1.9	2.0	2.1	2.4
Business applications	1.8	1.8	2.2	2.3
Simulations	1.7	1.6	2.0	1.9

Scale: 5=excellent skills, 1= poor skills

ICT skills of students (10-18):

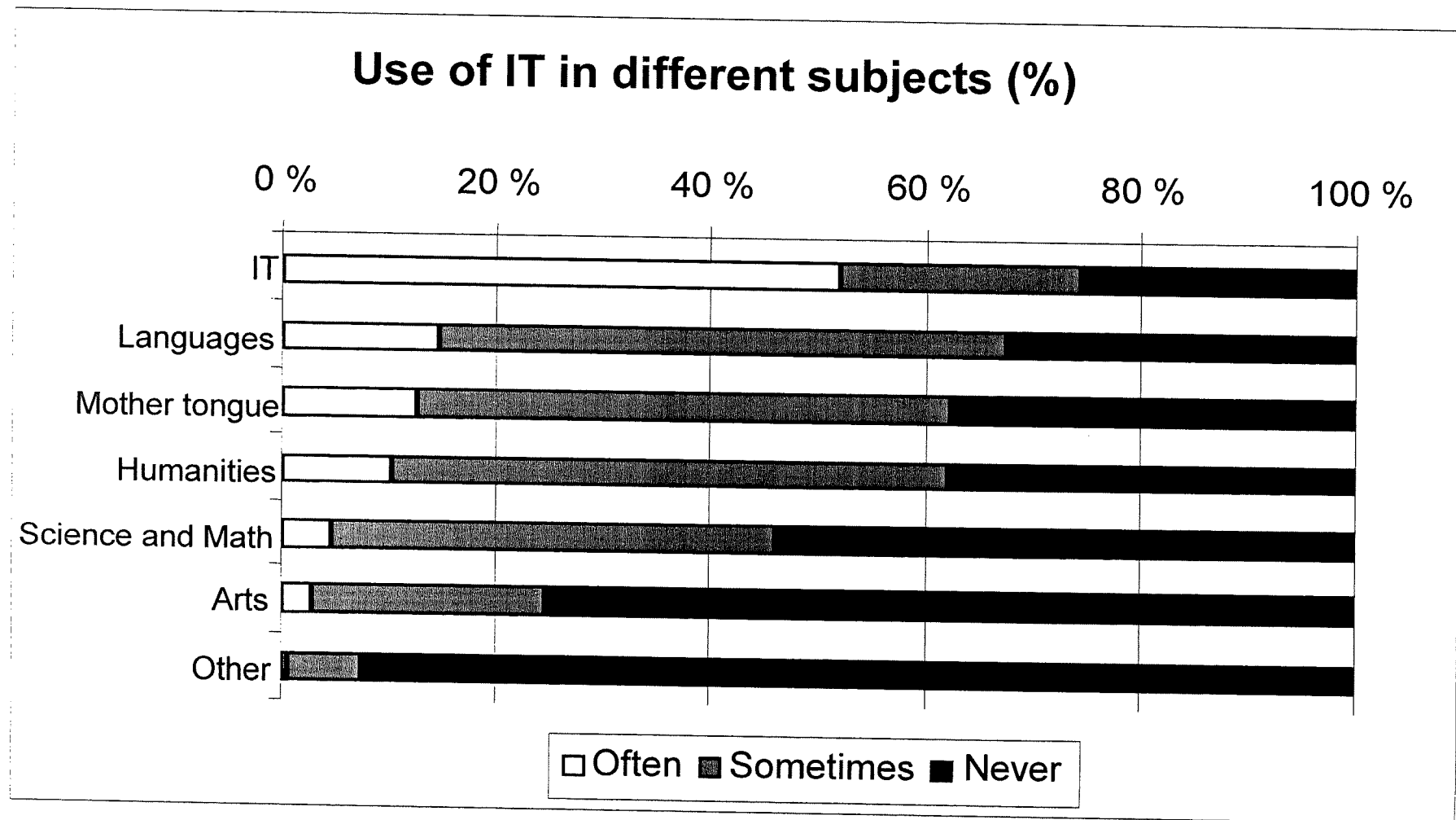
"I have good skills in..."

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

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

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

Use of ICT in schools according to students in 1998



Vision

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

Finnish Ministry of Education (1999)

Foci of the new strategy

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

Finnish Ministry of Education (1999)

Coverage

- All formal education
 - Primary and secondary
 - Vocational
 - Tertiary level
- Lifelong learning
- Research
- Public libraries (educational functions)

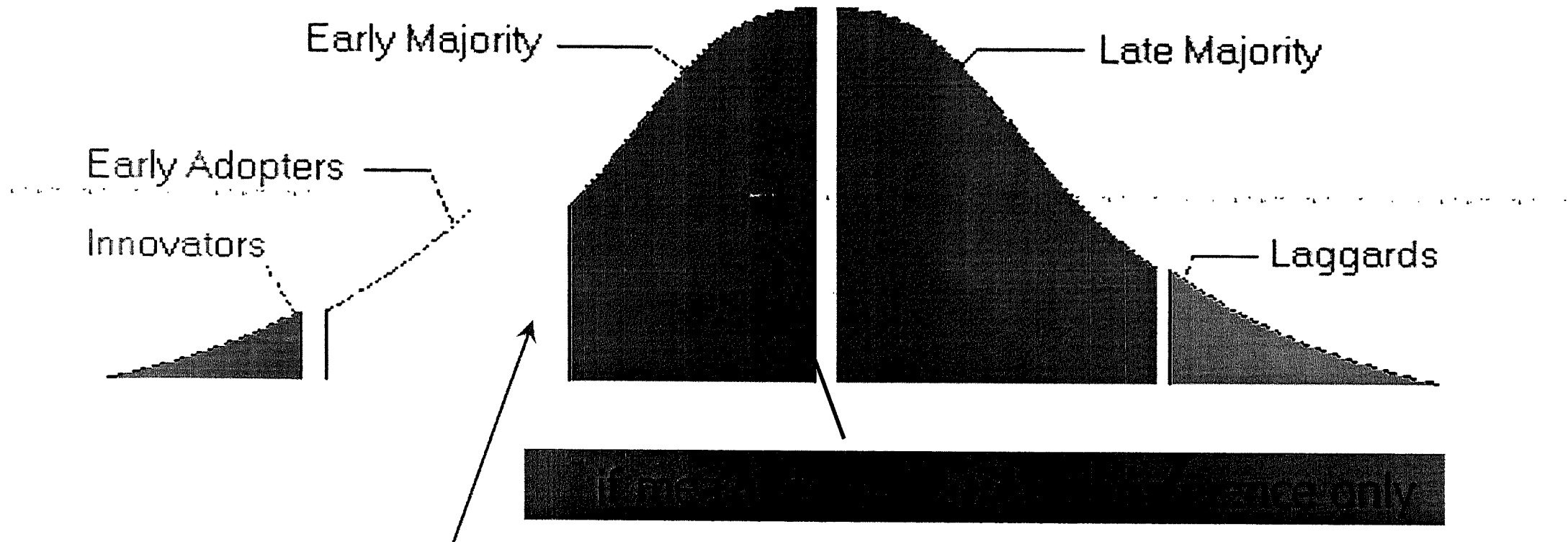
Finnish Ministry of Education (1999)

Funding and mobilisation

- to be ear-marked in the national budget
ca 55 MEuros / year *
- plus substantial contributions from
 - local authorities
 - public technology funds
 - EU programmes
 - private sector

* Average extra funding 1996-2000 - Finnish Ministry of Education (1999)
50 MEuros / year.

Adopting ICT in Finnish education & "Moore's Chasm"



if measured by substantial pedagogical value added

if measured by substantial pedagogical value added

The real rationale of any educational ICT strategy?

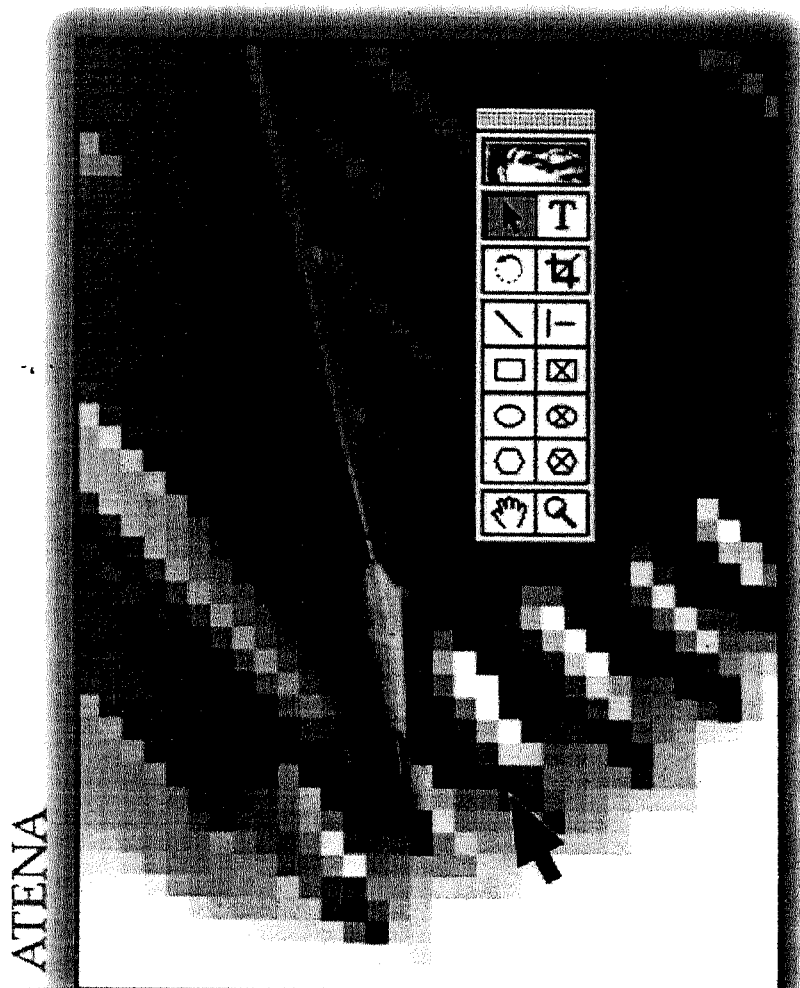
If you don't do your chores,
Mother said, I won't let you
have a birthday party & instead
of being nine, you'll be eight
for another year & none of your
friends will want to play with someone
younger than them.

by Hal Sirowitz, Mother Said (1996)

MATTI SINKO and ERNO LEHTINEN

The Challenges of ICT

Bitit ja
pedagogiikka

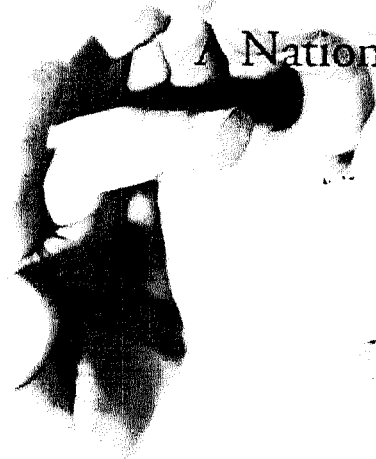


IN FINNISH EDUCATION

<http://www.sitra.fi/>

EDUCATION, TRAINING and RESEARCH in the INFORMATION SOCIETY

A National Strategy for 2000–2004



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

Outline of the presentation

- How to get started?
- How to make it last?
- Finland revisited
- Additional issues & Tips

Identifying the base-line resources

- Basic Infrastructure
 - buildings
 - roads
 - power supply
- Technical Infrastructure
 - cables
 - hardware & software
- Financial Resources
 - For Initial incentive funding
 - For Long-term sustainable funding perspective
- Societal, Social & Human Resources
 - Institutional & Legal Support
 - Political & Community Support
 - Knowledge & Motivation

Prerequisites

- One cannot build on the
thin air
- Realistic analysis of needs
and resources
- Make up worst gaps in the
infrastructure first

Rationales for Extra Funding

- to make up deficiencies
- to get started
- to make rapid impression and impact
- to gain political support
- to speed up processes

BUT NOT

- to run ICT in education

- Steady and healthy growth only can sustain.
- Real development is a long-lasting process.
- There are new and growing needs always ahead.
- Do not promise unrealistic results.
- Do not cheat yourself.
- A vision is not a strategy.

Sustainable development

- A strategy needs an implementation plan.
- Implementation requires a sound funding plan.
- Continuity of funding needs to be secured.
- There is life after election.

A Country like Finland in 1990s revisited

**Some Economic aspects
of the Case**

Problems in late 1980s

- economy based too much on large scale paper and metal industry
- weak SMS-industry sector
- too large agricultural sector with too low productivity
- export too dependant of the bilateral Soviet trade
- deregulation of the economy together with the collapse of the Russian market lead to a deep recession

Critical factors limiting change in 1990s

- high foreign and public debt
- high and long-lasting unemployment creating social disintegration and divide
- high taxes
- a great number of bankruptcies
- lowered economical activity
- cuts in public educ

Rationales for the national Information Society Strategies of 1995 and 1998

- anticipate global technological, economical and political changes
- regain competitiveness of the Finnish economy in the changing world, hence
- restructure the national economy
- restructure the whole societal infrastructure
- prevent social exclusion and disintegration

Measures taken to pull through

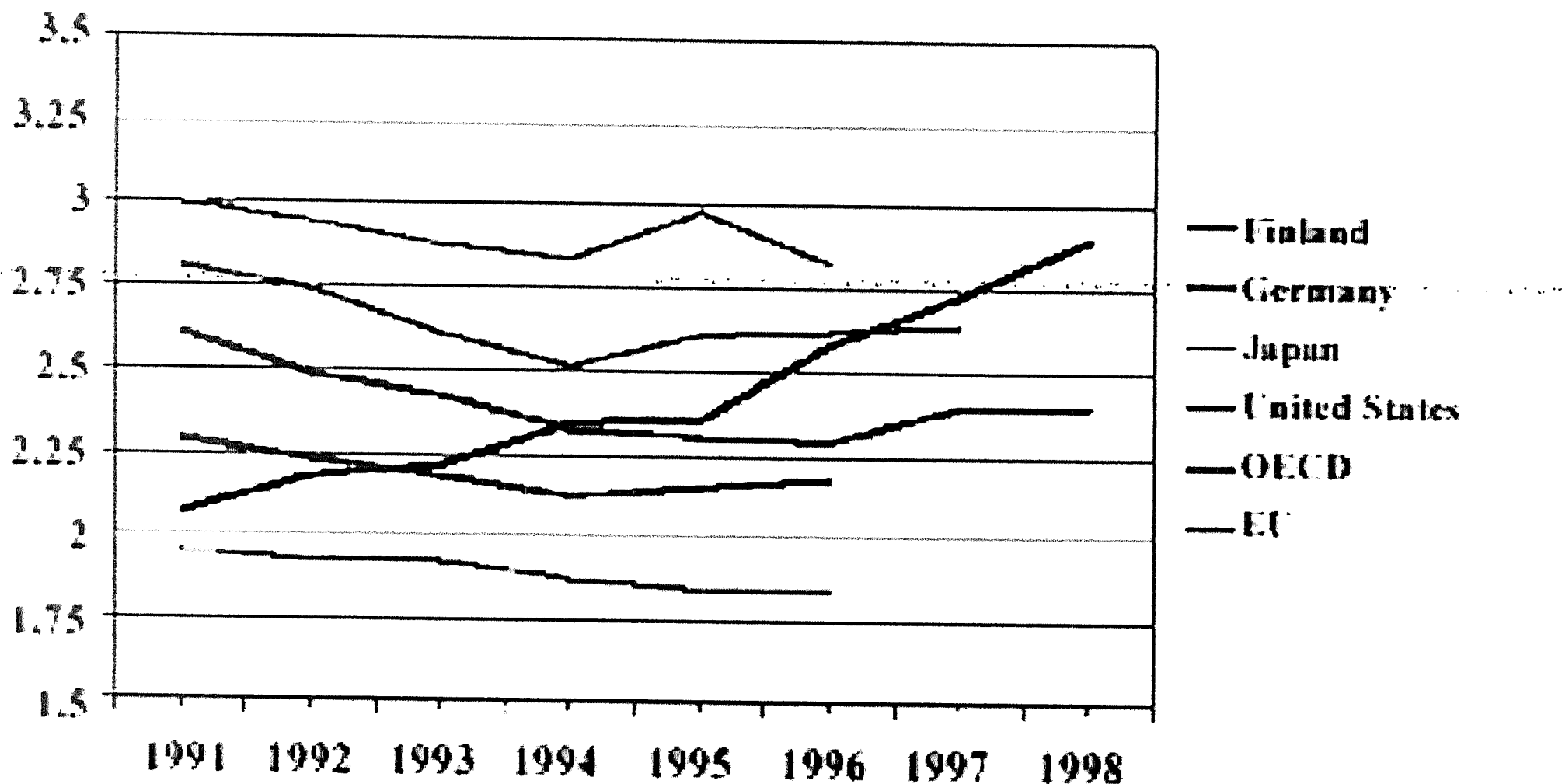
- trimming the liberalised economy
- membership in the EU
- information society strategies
 - investing in research & development, especially technology
 - investing in ICT industries
 - investing
 - in education
 - in training of ICT professionals and
 - in ICTs in education
 - liberalising telecommunication

How have we managed to overcome the recession?

- fairly well
- even though course of events caught us by surprise
- the changes have been much bigger and faster than anticipated
- the pain and price of recovery has been great: social exclusion by too many
- widening digital divide

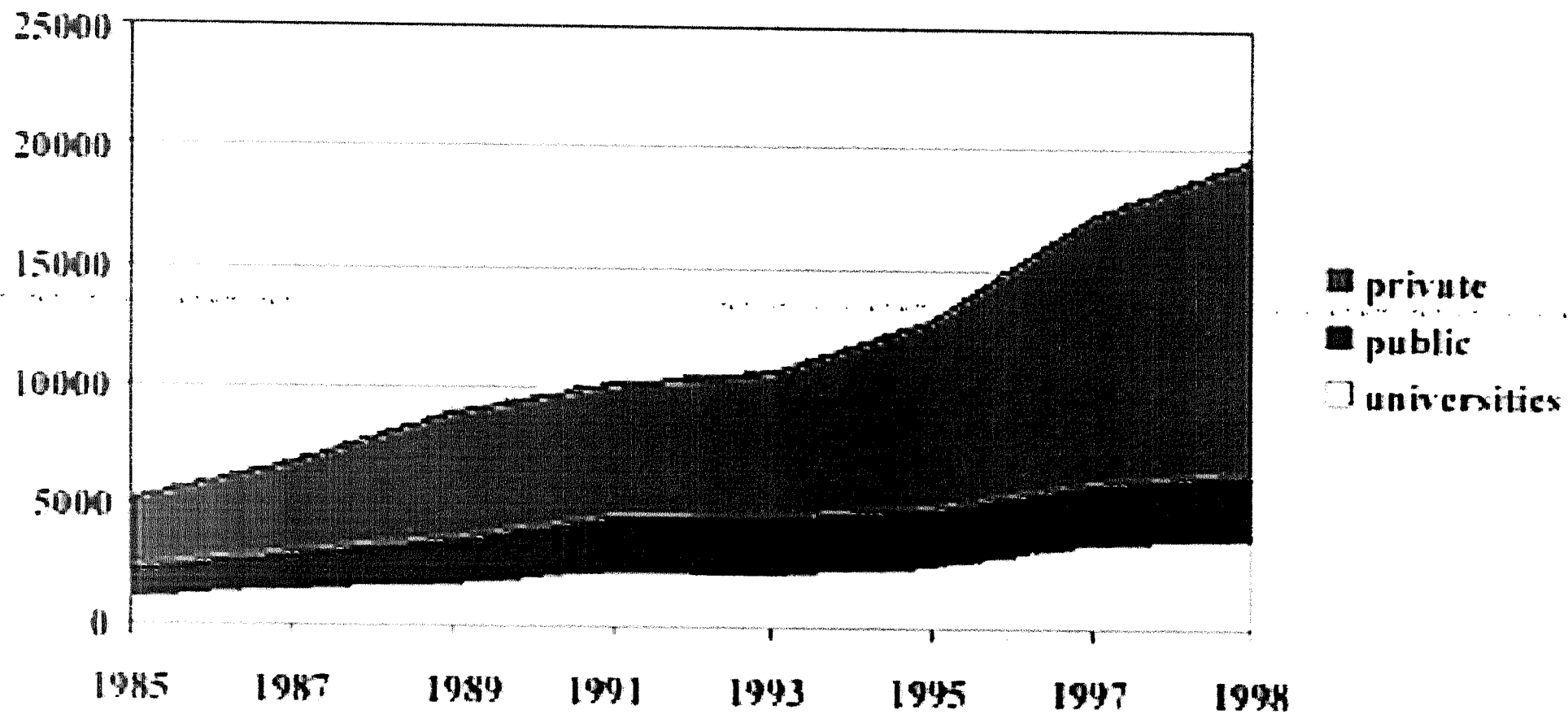
A model of long-term funding

R&D EXPENDITURE as % of GDP



R&D EXPENDITURE BY SECTOR

FIM million



One approach to globalization

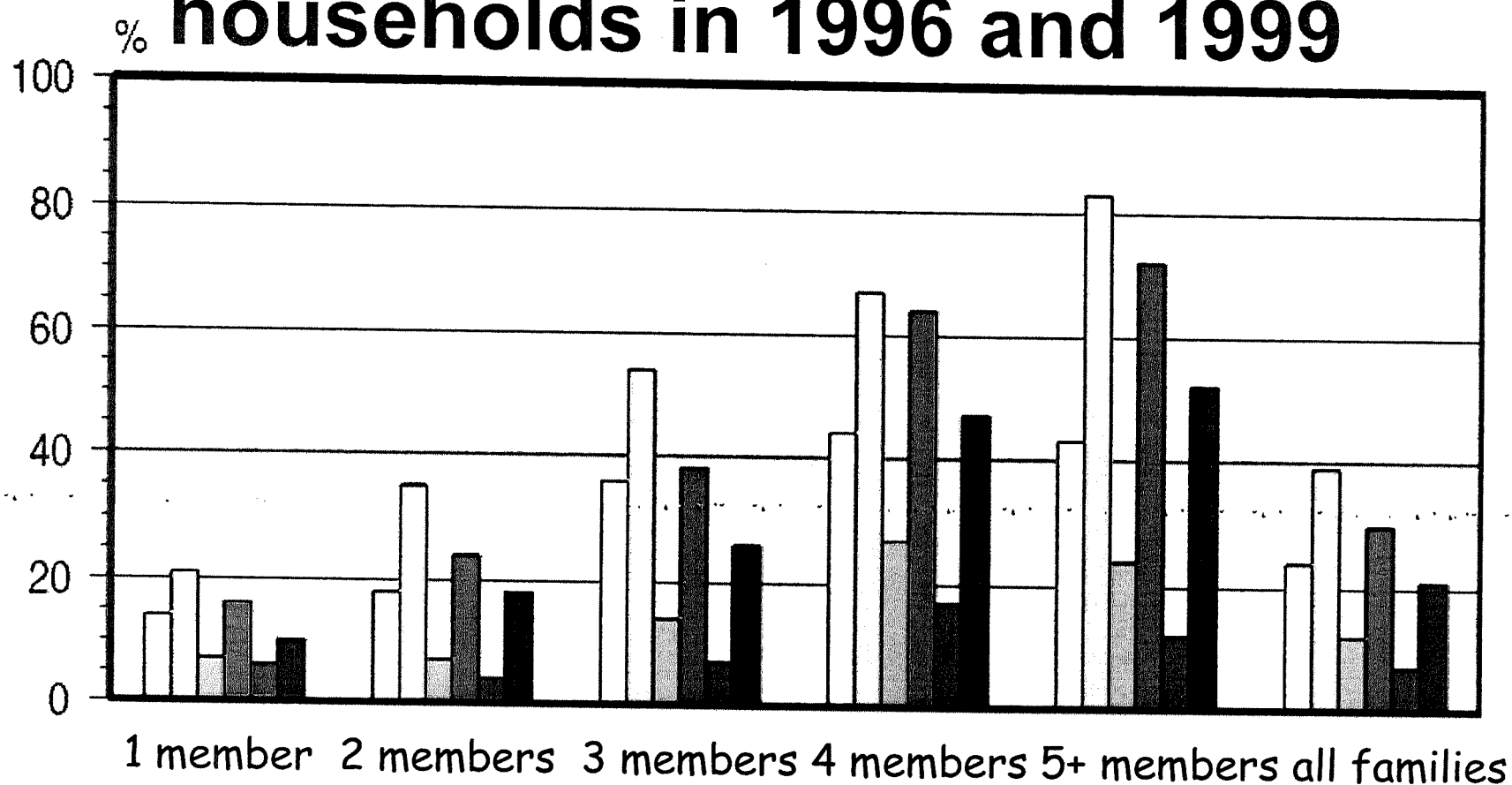
Education, training and research in the Information society.

A National strategy for 2000-2004.

Finnish Ministry of

Challenges/Threats	Needs	Opportunities/Measures
international crises and environmental crisis	global responsibility, solidarity and sustainable development	<ul style="list-style-type: none"> ethically sustainable moral code for the information society sensitivity to react to crisis distribution of educational skills adopting skills in accordance with sustainable development on all levels
globalisation, stiffening competition and scope of challenges	successful competition (nation, enterprises, individuals)	<ul style="list-style-type: none"> top-ranking research and education collaboration between private and public sector in particular international collaboration
in addition to the former, the internationalisation of educational markets	finding national and international synergy, safeguarding national information and teaching material production	<ul style="list-style-type: none"> participation in networks coordination of national competence raising educational quality through development of research and methodology development of educational technology and educational services
rapid renewal of branch structure and work contents	development of basic general education and occupational skills, and the motivation to acquire these	<ul style="list-style-type: none"> development of educational system, contents, services and professional competence of teachers
the challenge of information society development to high-level skills and know-how	securing the supply of employees with high-level skills and know-how	<ul style="list-style-type: none"> increasing the efficiency of information and content industry centre of excellence policy
supporting mobile and flexible work and study	services independent of place	<ul style="list-style-type: none"> new wireless solutions
convergence of communication techniques	pedagogical and business innovations	<ul style="list-style-type: none"> new business activities virtual studies
the ever more rapid cycle of innovations in ICT	strategic planning at all levels	<ul style="list-style-type: none"> new products and services lower prices
the rapid renewal of information and information becoming out-dated rapidly	learning to learn, knowledge management, opportunities to rapidly update contents	<ul style="list-style-type: none"> cooperation, networking, digitising of material, learning how to manage information more efficiently
complex problems and information as a central production factor	the constant need to revise activities and skills in organisations and working communities	<ul style="list-style-type: none"> multi-field expert collaboration combining work and studies network competence
ageing population and social exclusion; regional inequality	maintenance of the integrity of the nation, safeguarding equal opportunities	<ul style="list-style-type: none"> study opportunities for everyone improving the availability of information society services securing educational services
public sector financing crisis	increasing efficiency, cost savings, increase in tax income, redirecting funding, development of new collaboration models	<ul style="list-style-type: none"> upgrading contents and methods open and distance learning job-specific training increasing the efficiency of monitoring and evaluation removing structural obstacles (work conditions, standards, statutes, etc.) new cost models

ICT infrastructure of Finnish households in 1996 and 1999



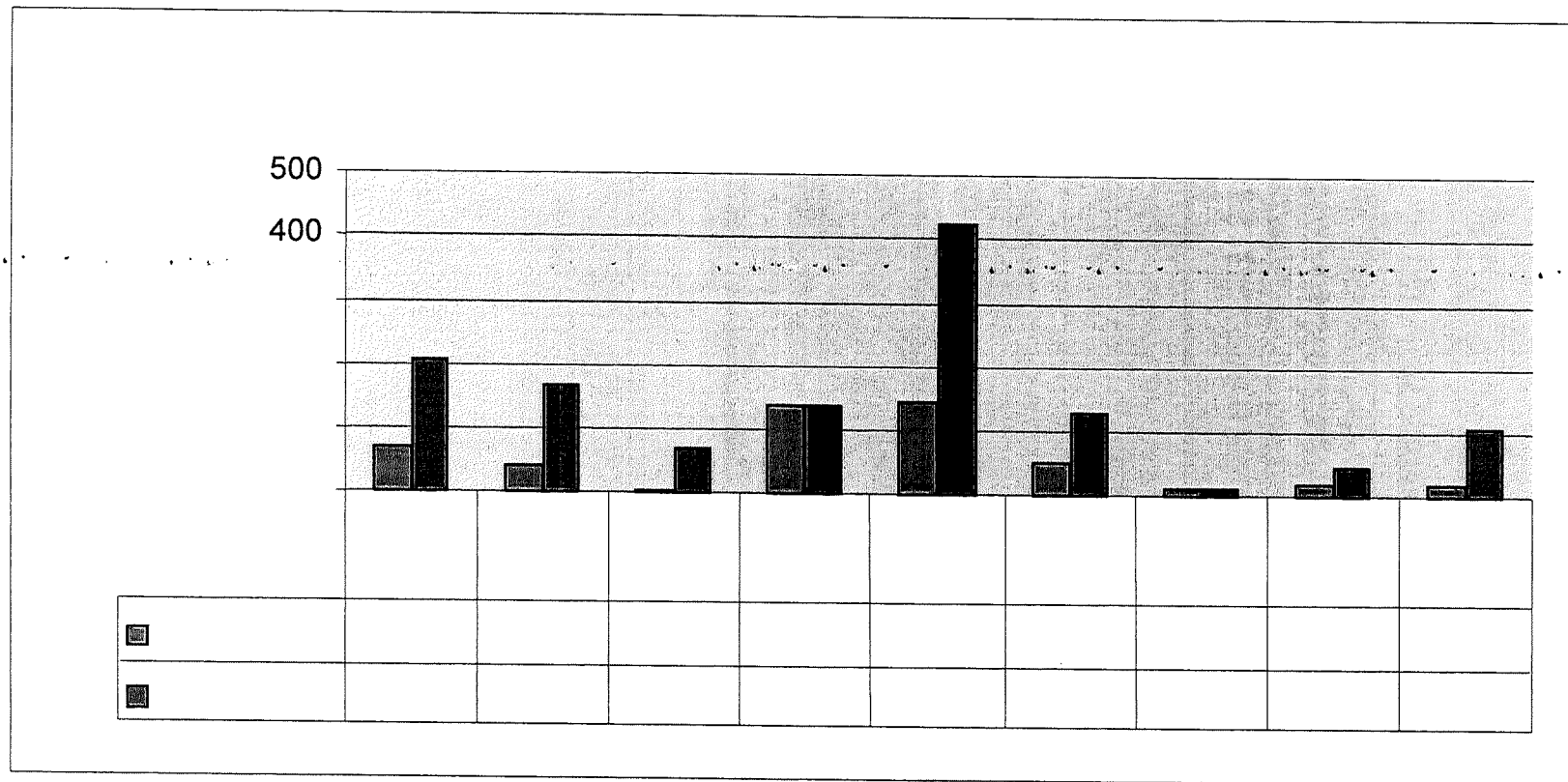
Home pc 1996
 CD-ROM 1996
 Access to Internet 1996
 Home pc 1999
 CD-ROM 1999
 Access to Internet 1999

Juha Nurmela
 Statistics
 Finland

2000

At least one mobile phone in 78 per cent of households

Approximation of and proposal for ICT expenditure in the 1-12 education



Thumb rules

- Mind the digital divide by mobilising less-favourite, too.
- Mind Moore's chasm!
- Active technology foresight pays off.
- Retain cultural sensitivity: do not throw away or suppress national or local languages or other characteristics.

Suggestions for implementation

- be realistic
 - when assessing the base-line
 - when assessing the resources available and necessary
 - when assessing the hinges
 - even in visions
- compromise honestly
- recognise the bottle necks
- keep in mind that capacity building takes time
- education is more than training ICT specialists

Issues related to funding models

- Public funding: national / local
- Donors: international / domestic
- Return on investment
- eLearning as a business
- Stakeholders
- PPP

Who should decide?

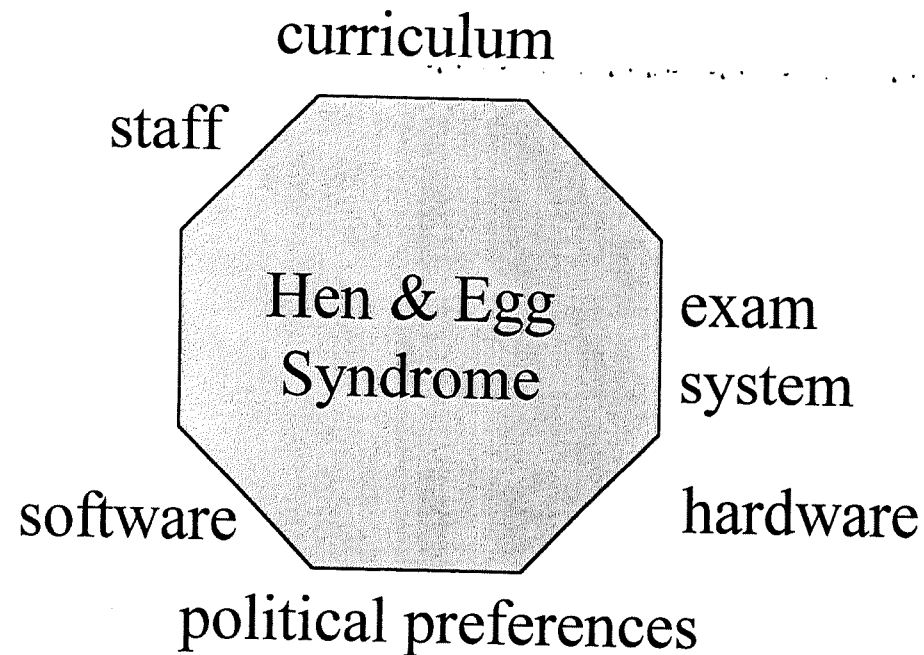
- top down
- bottom up
- mixed mode
- optimising the decision making procedure: identifying the stakeholders?
- network-based capacity building and resource building

Marketing education as a promising ICT investment area

- necessary to do
- easy to do towards parents
- easy towards politicians but their expectations are often misleading
- difficult to get long-term commitment from the private sector (a chamber of commerce vs. a micro-chip company?)

How to avoid the bottle necks?

Right pacing of investments is crucial.



Choosing the most appropriate implementation procedures

- project vs. line organisation
- project vs. process
- good project management praxis
 - splitting the project into manageable and measurable tasks and work packages
 - why-what-who-with whom-at what level-how-when-where
 - life after the project
 - manageable size and scaling-up afterwards

De : Dr. Passi bk <passi.bk@kmutt.ac.th>

À : smirnova irina <irina.smirnova@iite.ru>, sinko matti <matti.sinko@hut.fi>, bernard cornu <bernard.cornu@grenoble.iufm.fr>, aston mike <mike_aston@kcited.demon.co.uk>, morel raymond <morel@uni2a.unige.ch>

Date : Lundi, 21 mai 2001 12:57

Objet : in resposne to bernard's request for starting electronic dialogue- for forum

iite

From: B.K.Passi (Thailand and India)

Dear colleagues

During our high level seminar at Moscow, we had considered various aspects of integrating ICT in education and their policy implications for participating countries. During my presentation on technological issues, I had presented a few slides for the consideration of policy formulation.

I understand that our colleagues are formulating these policies; therefore, I have developed the guiding principles for their consideration. I am placing the same on the IITE web so as to help the use of the grid that was developed during the seminar.

I also recall the presentation by the participating countries that were repeatedly seeking the guiding principles and the momentum for action. These guiding principles may be useful for the participating countries operating at the 'emerging level', 'applying level', 'integrating level', and 'transforming level'.

Policy Formulations for Technology Issues

The policy-framers and decision-makers are captains for guiding the ships for future destinies. The creation of a meaningful dialogue amongst these persons is mutually useful. The participants looked into different scenarios of emerging technologies. The rationale of this dialogue lies in the enunciated principles, as given below.

1. **Technology production, purchase and transfer:** Purchase and distribution of technology and software can create unhealthy competition among nations, regions, schools and other stakeholders. Local and global

measures should be taken to check and counter balance the dangers of this possibility.

2. **Computers and other peripheral machines:** Production and supply of computers and peripherals will continue to improve in their capacity, cost and available quantity. The first rate machines will never be available to all the potential users, in the first go. We have to accept the principle of progressive and gradual development, as far as equality is concerned. Alternatively, new supporting policy measures have to be designed at country levels.
3. **Satellites:** The production, maintenance and utilization of communication satellites by the big and powerful nations do have an edge over small and weaker nations. While formulating the strategies for purchase, hiring, and use of satellites, the cooperative policies should be formulated with the underpinning of 'give and take' between the nations.
4. **Software:** Development of software is an ever-increasing area of work. Software will require continuous up-gradation and maintenance. The improvement of machines and the escalating demands for new computer-functions will increase conditions of software production. The ever-increasing demand for this manpower across wide spread areas will require skillful handling. The demand of equal facility at equal costs needs to be applied with care and caution.
5. **Bandwidth:** The diversity of bandwidth of Internet is discriminatory against the 'have-nots' and the 'late starters'. The gradual progress of technology versus the sudden introduction of broadband will ask for supporting economy, mass production, and appropriate skill-development amongst the users. International and national policies will have to be formulated to meet these challenges.
6. **Technology divide:** Technology should be available to all the learners of all the nations irrespective of age, sex, religion, language, and region. The technology should be available free or at affordable costs. The present technology divide between 'haves and have-nots' should be bridged through appropriate policies and compensatory economic measures.
7. **Poverty eradication and talent development:** Technology should be used to solve the problems of poverty eradication and development of talent. Educating individuals about the types of societies and communities we want to build should be the foundation of technology education.
8. **Curricular areas:** The two trends, viz., 'technology-push' and 'pedagogical-pulls' has not gone hand in hand. There is an urgent need of undertaking researches to articulate the demands of pedagogical requirements. Research should identify the types of technology and software for different curricular areas like sciences, social sciences, languages, and others.
9. **Specialized technology for varying profiles of users:** The specialized technology for specialized functions required for teaching and learning will have to be tailor-made for different types of learners. Researchers have to conceive and articulate their demands for persons of varying capacities and styles of learning. Along with the needs of the learners, technology policies for

facilitating the work of teachers and parents will have to be researched upon with equal emphasis.

10. **Integration of ICT:** Integration of ICT in education will not take place automatically. It will require special support to develop interaction among researchers, consultants, professional teachers and students for maturing special cognitive tools for curriculum and teacher training.
11. **Technology phobia:** The technology must be robust and simple so as to create not only a user-friendly environment but also user-modifying environment by designing new tools that will create excitement for technology rather than the ever-growing technology-phobias. Ongoing professional development for teachers, parents, and community members should enhance the use of technology-based resources to their fullest potential.
12. **Research:** Technology should facilitate research-using world as a 'laboratory both for communication and interaction' via electronic e-mail, fax-machine, and video conferencing. Accept the significance of researching, developing, selling and marketing information technologies. Technology must be recognized as an evolving process. Technological growth should be provided with continuous, recurring attention and resources.
13. **Pedagogy-driven technology:** We need to create pedagogy-driven technology policies rather than technology-driven policies of pedagogy. The international bodies, national governments, and civil societies will have to play a major role in checking this trend of market forces.
14. **Integrating technologies:** Technologies should be supported that are helping to integrate learning across subjects, age groups, learning styles, medium of interactions and abilities.



Issues of Economy

Moscow

April 2001

Matti Sinko

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Some economic and political aspects

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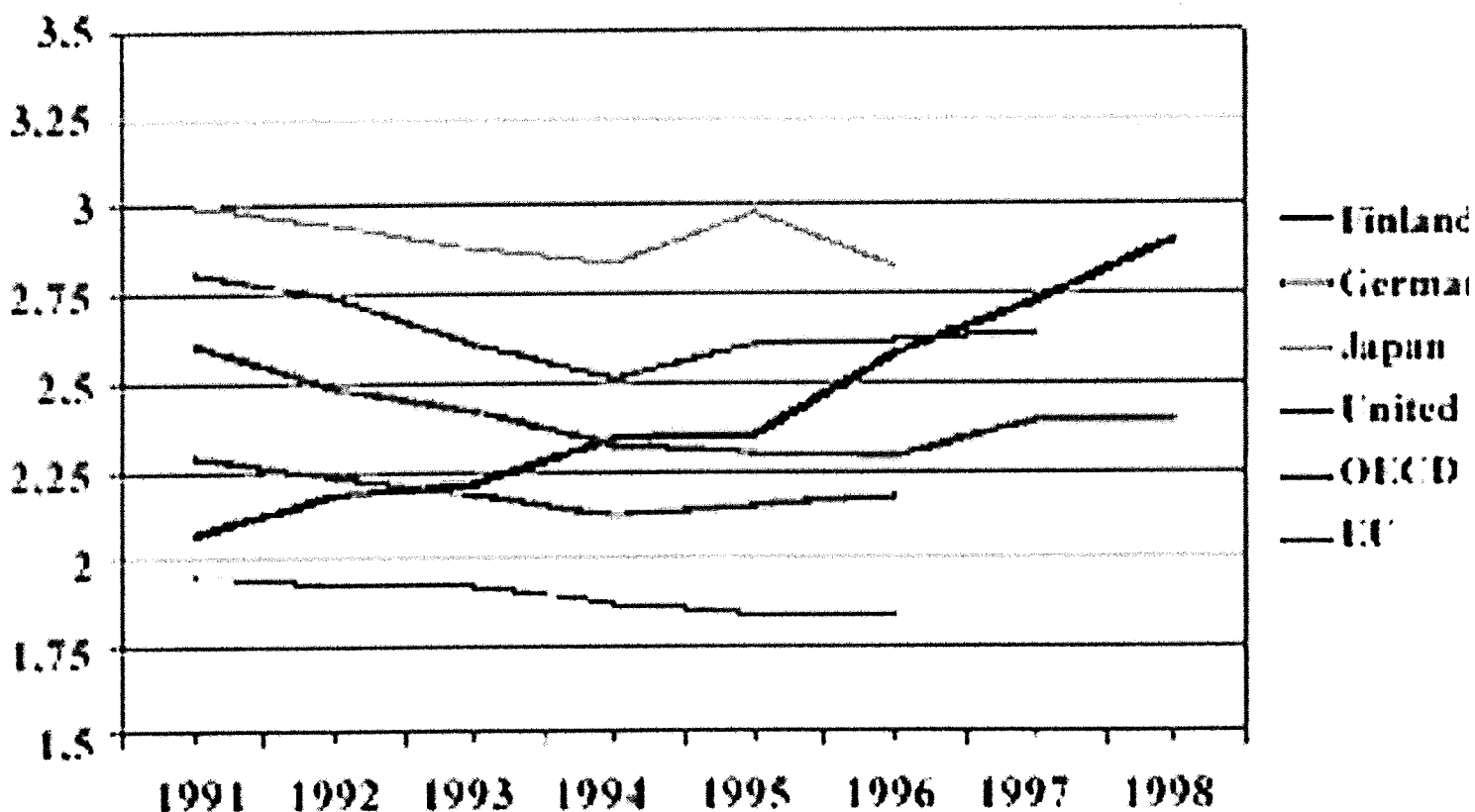
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How have we managed to overcome the recession?

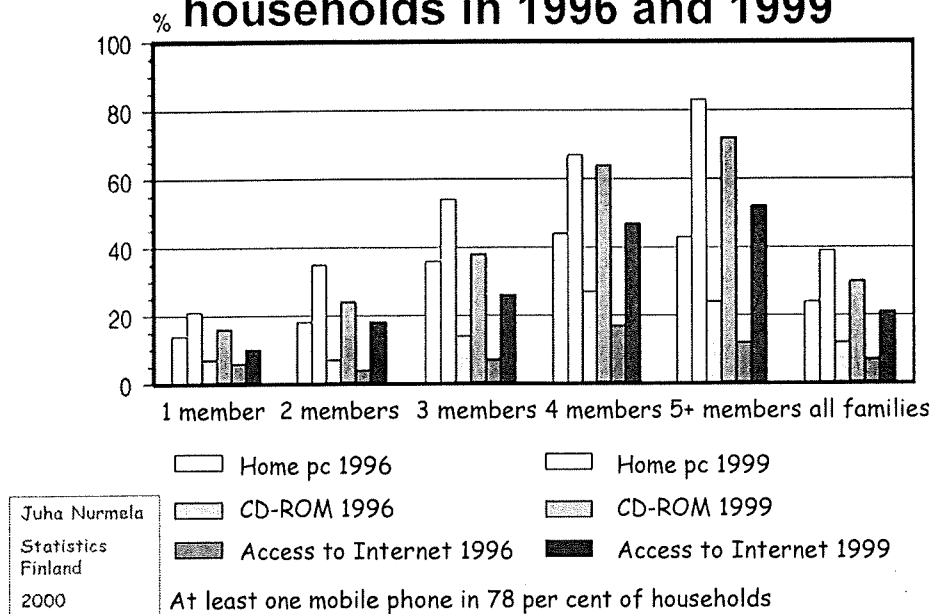
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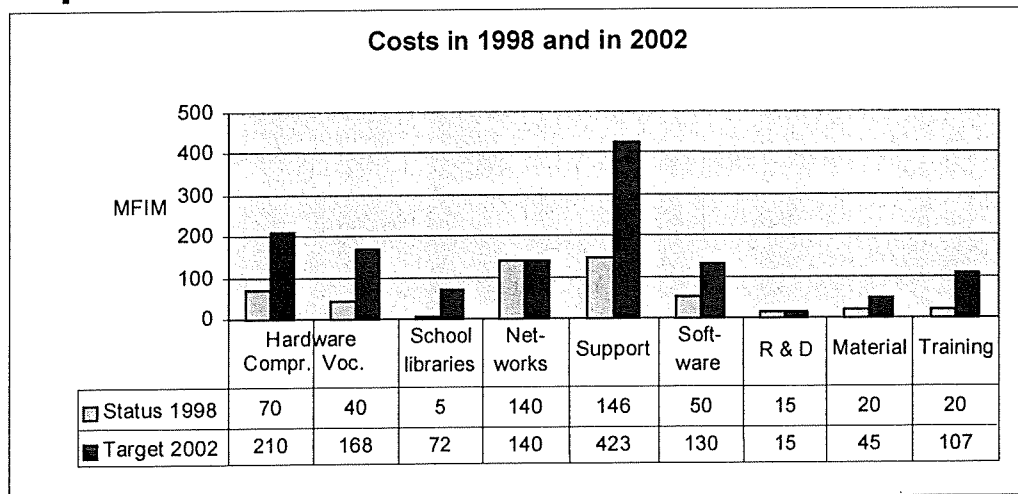
R&D EXPENDITURE as % of GDP



ICT infrastructure of Finnish households in 1996 and 1999



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One approach to challenges of globalization

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Suggestions for implementation

- be realistic
 - when assessing the base-line
 - when assessing the resources available and necessary
 - when assessing the hinges

- even in visions
- compromise honestly
- recognise the bottle necks
- keep in mind that capacity building takes time
- education is more than training ICT specialists

Issues related to funding models

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Who should decide?

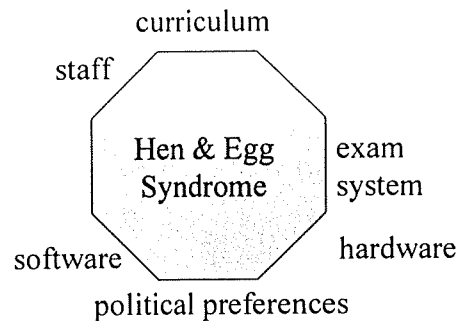
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- bottom up
- mixed mode
- optimising the decision making procedure: identifying the stakeholders?
- network-based capacity building and resource building

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- easy to do towards parents
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- good project management praxis
 - splitting the project into manageable and measurable tasks and work packages
 - why-what-who-with whom-at what level-how-when-where
 - life after the project
 - manageable size and scaling-up afterwards

MA

Lithuania

Notes for summarizing

Main aspects	Core problems ^{principles}	Main problems and "bottle necks"	Ways of overcoming, success practice	Recommendations	Other comments
Political, economic and social conditions for integrating ICTs into education					
Technological conditions for integrating ICTs into education					
Pedagogical aspects Software	Currently IT in grades 9-10 none in Lithuanian	Integration of ICT very poor 76% of HT's cited lack of software	<u>Curriculum design at stage II</u> Science + ICT supported by research and ed. inst. Impl. in 3 rd stage		
Ethical aspects					
Teacher aspects	pre IT 1-2% IT No incentives for teachers to use				
Funding and fundraising					
International and cross-national co-operation					
Other aspects	ICT co-ordinators in schools need not be experts!	Perception that the Internet is ICT!!			

The task sheet for the homework

Please indicate by ticking (✓) the cells your national/regional priorities.

Country/region: Lithuania

	Short-term (1-2 years) plans		Long-term (3-5 years) plans	
	Producing	Updating / Revising	Producing	Updating/ Revising
Rationale & Aims		✓		✓
Objectives		✓		✓
Methods of implementation		✓	✓	
Funding plan		✓	✓	
Quality Assurance and Evaluation, Indicators		✓		✓
Focus on primary phase	✓		✓	
Focus on secondary phase		✓		✓
Focus on tertiary phase		✓		✓
Focus on adult education	✓		✓	
Special needs		✓	✓	
Curriculum & pedagogical development				
ICT as a subject		✓		✓
ICT across the curriculum		✓	✓	
Vocational ICT training		✓	✓	
Software	✓		✓	
Generic software tools		✓	✓	
Subject specific software and digital materials		✓	✓	
Localising, versioning, licensing	✓		✓	

Production, delivery, updating and use	V		V	
Capacity building				
- Pre-service teacher education		V	V	
- Staff development		V	V	
Support				
- Technical	V		V	
- Pedagogical	V		V	
- Media design	V		V	
Technical infrastructure	V		V	
Hardware	V		V	
Local-area networks	V		V	
Wide-area networks (Internet)	V		V	
Management				
- national level		V	V	
- local level	V		V	
- institutional level	V		V	
Quality Assurance, Inspection	V		V	
Research		V	V	
Student assessment		V	V	
Other, please, specify				

Dainius Numgaudis, Vainas Brazdeikis, LT

A. Analysis of the grid

Aims/Objectives/Methods/Funding plan/Evaluation

- Today we had the Strategy for Information and Communication Technology Implementation in the Lithuanian Education. This strategy producing aims and objectives is for short and long terms.
- Mostly concrete works and programs of implementation are planned by the short term
- There are some problems with funding plan: Constant funding is not provided for ICT implementation in education. It is only for one year's.

Focus/curriculum

- Main focus is in the secondary phase. Most students learn to work with computers and software only in higher grades (since the fall of 1999 the compulsory informatics course has been introduced to the curriculum of 9–10 grades of the lower secondary school) and computers can be use only during classes of informatics. The level of computer skills of Lithuanian students varies: boys are better than girls; performance of students in cities and town centers is better than those of rural schools.
- Today students' computer skills are developing through the general syllabus of informatics. The goal of teaching informatics is to develop the students' information culture. While developing practical skills of work with the computer a lot of attention is still being paid to technical matters and technology rather than to the development of students' general and information culture.
- The integration of informatics with other subjects is very poor.

Software

Most of op. system and general purpose software and educational programs are not available in the Lithuanian language. Most school libraries do not have a computer or software to develop information skills and manage catalogues.

Capacity building

- Several universities have been training teachers of informatics. Studies of informatics are commonly coupled with the studies of mathematics. The ICT course makes up 1–2 % of the studies program of teachers of other subjects.
- The competence and qualification of graduates at the educational teacher training institutions in ICT integration in education is very low.
- Undergraduates of informatics are not trained to become ICT coordinators.
- Standards of teachers' technology and information literacy have not been prepared and approved.
- There were more than 40 teachers' in-service training institutions at the municipalities and region centers. Part of them had special computerized training centers. Only very few in-service training institutions have a sufficient number of technical, financial, and intellectual sources to organize ICT in-service training courses of good quality. Teachers' in-service training courses focus on the development of technical skills, but very little attention is being paid to the didactic aspects of integrating the latest technologies into education.
- If compared to the situation in other countries, only a very small number of teachers of Lithuanian general education schools have at least elementary computer skills.
- Teachers need more possibilities to constantly update and improve their knowledge.
- Information about ICT is spread slowly, the potential of ICT coordinators, experience of computer studies' and other teachers as well as other internal school resources are not fully realized.
- There is very little incentive for teachers to use computers in education.

Support

- *Hardware.* Primary schools practically had no computers for teaching and learning needs. On average, 60 students of upper secondary schools in the country had one computer for educational needs. Schools have a lot of

outdated and inefficient hardware, which does not satisfy educational needs. School libraries and other learning places have very little hardware.

- *Telecommunications.* Lithuanian schools can use services of non-commercial (e.g., LITNET) or commercial (e.g., Omnitel, Lithuanian Telecom) Internet providers. Telecommunications (e-mail or WWW) can be used by more than 90% of Lithuanian upper secondary schools that have computers; however, in most of them the Internet is connected only via dial-up line and only from one computer at school.

Management

- The potential of research and educational institutions, faculty and students has not been fully realized in implementing ICT in education.
- Non-governmental organizations and funds initiate and support various ICT implementation projects. In most cases non-governmental institutions support independent initiatives of educational institutions financially but do not participate in their implementation. Funds and non-governmental institutions can play a secondary role, whereas the state shall solve the essential ICT implementation problems.
- Commercial and industrial companies usually support ICT implementation in education by allocating certain funds and providing second-hand hardware.
- Lithuanian upper secondary schools, which are used to the centralized computerization of education, do not pay enough attention to the development of their own information systems: less than one third (29%) of schools have prepared their plan or any other document of ICT implementation at school. Only 15% of Lithuanian general education high schools have a full-time ICT coordinator; in most schools (82%) informatics teachers perform these functions.
- ICT implementation is still centralized in the Lithuanian education.
- Very few schools have specialists who are responsible for ICT implementation.
- Informatics teachers play a very important role in the coordination of the implementation of the new technologies at school.
- Computers have been applied only to perform elementary administration work.

B. Bottle necks”

Opinion of school headmasters (© IEA SITES M-1, 1998-1999)

- Lack of computers 93%
- Lack of educational software 76%
- Lack of knowledge and skills of teachers on using ICT 61%
- Difficulties with integration of computers into the teaching process 53%
- Lack of motivation of teachers to use computers 49%
- Lack of time for teachers to explore an Internet 45%
- Lack of opportunities for teachers to learn ICT 42%
- There is no opportunities in the timetable for free access to the Internet 42%
- Lack of personnel to see what pupils are doing with computers 28%
- Teachers haven't time to prepare for the lessons with access to ICT 28%
- Lack of pupils skills to use an Internet in the lessons 28%

ICT implementation is a complex task, which includes all elements and areas of education and influences the concept of education and the teaching system. The performed analysis proves that the Lithuanian education needs a purposeful and systematic ICT implementation policy, which includes various areas of education. The most important areas are:

- 1) The relationship between society and education (life at school are changes very slowly);
- 2) Contents and methods of education (integration of ICT with other subjects is very poor; academic knowledge on informatics subject)
- 3) Provision of computer equipment and teaching aids (lack computer, aids, network0;

- 4) The teacher's role and methods (lack IT standard for teacher's);
- 5) The connection between science and education (not realize science resource for implementation IT in education);
- 6) Management and funding of ICT implementation (not constant funding, not co-ordinate management, not flexible funding schools).

Of course we could see very positive circumstance: positive political opinion, cherishing informatics subject, support from non-government and private sector, good knowledge some specialist, initiative from some schools, scientist interest and experience, information about situation

C. The task

I. Life at school, the relationship between education and society

Life at school should reflect the relationship between public life and education like a mirror. To socialize, the school shall organize its life by simulating the model of public life. On the other hand, the school shall orient itself towards such modes of life that are hardly visible now but have great prospects in the future, i.e. the school shall stimulate the progressive renovation of society and prepare a student to live in a self-creating society

II. Contents and methods of education

The integration of ICT and the change of educational contents and methods take place when there are two closely connected goals of education: first, students' technology and information capabilities shall be developed, which will be necessary in the future society; second, ICT catalytic potential shall be used to speed up the educational reform.

III. Provision of computer equipment and teaching aids

One of the most important preconditions to completely integrate ICT in education is the sufficient amount of computer hardware and software, its suitability to meet the students' needs, possibilities to use high quality information sources, global and local computer networks. Local computer networks shall be set up, the Intranet shall be established, and necessary conditions shall be provided to use worldwide global network information. All Lithuanian institutions providing general education shall be supplied with a necessary set of general purpose and educational software programs. The network of computerized teacher centers shall be expanded so that every teacher could develop ICT skills and their application in education in each town or district.

IV. Teacher's role and qualification

In this society, the teacher shall constantly improve professional, technological, and social competence. Forms, methods, and aids (distance learning, assistance and communication network, etc.) of life-long learning shall be the essential elements in teacher training and in-service training systems. The competence of specialists of school information centers to apply modern information technology is of utmost importance.

V. The connection between science and education

Lithuania has capable and experienced scientists and their teams who can carry out investigations and practical applications of ICT implementation in education. Closer co-operation of research and educational institutions with schools could encourage scientists to contribute more realistically to the modernization of education, to bring closer the solution of scientific problems to the education at schools. Research on the ICT implementation in education shall be the priority area of information and educational science.

VI. Management and funding of ICT implementation

The success of ICT application at school depends on the co-ordination, co-operation, and external support of all activities carried out by all levels of the educational system (i.e., country, local authorities and schools). The state shall play the most important role in initiating, managing and financing the ICT implementation. It shall provide the guidelines of educational computerization, co-ordinate activities of various institutions, initiate and carry out the most important activities, which cannot be performed by the lower levels of educational system independently. Having guaranteed the financial support for implementing ICT, the state shall provide all possible opportunities for lower levels to choose and make their own decisions. The national legislation and the selected strategy of educational

computerization shall stimulate active participation of non-governmental organizations, funds, commercial, industrial, scientific and other institutions in ICT implementation in education.

Implementation of the most relevant ICT tasks is divided into 4 consequent stages. In every stage, the main intellectual resources and the biggest part of funds are allocated for the reorganization of one or several selected areas of education and implementation of ICT in them. The activities in other stages are dedicated for the consolidation of the previous work results and implementation of new tasks.

The prospective duration of every stage is one year. The time allocated for each work depends on the funding. Division of task implementation into stages is proposed in the form of recommendations. If the assignation is increased, most lower priority level tasks can be implemented before for the end of the previous stage. When implementing the Strategy, the holistic attitude towards ICT application shall be preserved.

Stage I

In the first stage of the Strategy implementation, the highest priority is given to the tasks of three ICT implementation fields, the successful solution of which depends on the possibilities to implement other tasks. This preparation stage aims at the development of financial, legal and technical foundations, provision of elementary ICT skills for the staff, which ensures successful continuation of ICT integration into education.

Stage II

The second stage includes modernization of libraries and development of teachers' computer centers with the purpose to implement ICT in school libraries.

Stage III

The third stage, *ICT integration into education*, focuses on the maintenance of students, teachers and all citizens' technology literacy, ICT integration into teaching and learning of various subjects.

Stage IV

The main activities of the fourth stage, *the development of educational network*, are performed to develop the network infrastructure and to wider apply telecommunication capabilities in the school life.

Table 1. Priorities of ICT implementation in the aims and tasks of education

<i>Pri orit y</i>	<i>Relationship between education and society Life at school</i>	<i>Contents and methods of education</i>	<i>Provision of computer equipment and teaching aids</i>	<i>The role and qualifications of the teacher</i>	<i>The union between education and science</i>	<i>Management and funding of ICT implementation</i>
I			In 9-12 grades: to achieve the ratio of one computer per ten students and to provide schools with general purpose software To plan ahead measures, legalize and localize general purpose software	To develop the standards of teachers' information and technology skills and to provide all necessary conditions for 9-12 grade teachers and school librarians to acquire elementary skills.		To set up the management and funding procedure of ICT implementation To stimulate commercial, non-governmental organizations and individuals to support ICT implementation To include scientific institutions in the ICT implementation To prepare the strategy of ICT implementation in teachers' in-service training. To develop the strategy of educational networking infrastructure. To develop accreditation requirements and the system of teachers' ICT competence.
II	To expand the services and functions of school libraries	To prepare ICT literacy standards for the general education school. To prepare universal curricula, which integrate ICT To present methodological proposals on how to integrate ICT into various subjects	To modernize school libraries To encourage the development of software for schools in the Lithuanian language To modernize the resources of school computer centers To establish teachers' computer centers in districts	To develop ICT literacy standards for informatics teachers To develop ICT literacy standards for technology co-coordinators To develop compulsory information and ICT application standards for school librarians	To stimulate the scientists of humanities and social studies to prepare software, information sources and distance teaching materials	To expand and sustain the role of municipalities in ICT implementation To develop the strategy of distance learning application in general education
III	To maintain technology skills of all citizens		To achieve the ratio of one computer per ten students in 7-12 grades and to provide schools with general purpose software To localize the most important software used at schools To prepare electronic publications and other sources of information	To gradually provide conditions for 1-12 grade teachers and other educational staff to acquire basic elementary information and technology skills	To encourage co-operation between scientists and teachers on the issues of ICT implementation To carry out investigations into ICT implementation in education	7.1.c) to expand the power and responsibility of schools' self-government bodies
IV	To develop the system of collecting and disseminating information on education To implement ICT in school management and self-government To maintain new social and cultural norms and ethics		To connect school computers into the local network and to implement the intranet technology To connect school computers to the Internet			

General Principles of ICT Implementation in Education

1. ICT implementation in education complies with the general aims of the Lithuanian education.
2. When implementing ICT in education, the principle of equal opportunities is observed. Equal rights of children from dysfunctional families, students from rural areas and girls are constantly observed.
3. Special attention is being paid to the special needs of disabled children.
4. The Strategy of ICT implementation in education and its application is reviewed, evaluated, and amended every year.

The Role of the Ministry of Education and Science and the Main Principles of ICT Implementation

1. Every year funds from the educational budget of the country are allocated for ICT implementation.
2. The Vice-minister of Education and Science is responsible for ICT implementation.
3. Clear regulations to discuss and make decisions about ICT implementation in education have been developed and implemented.
4. ICT implementation is carried out according to the prepared special purpose programs.

The Main Principles of Carrying out the ICT Implementation Programs

1. The Ministry of Education and Science carries out computerization of national educational institutions according to the special purpose programs.
2. The programs provide concrete annual activities, methods of meeting the ends and performing tasks of the Strategy and criteria for evaluating the results.
3. The drafts of the programs are announced and discussed in public.
4. Purchasing, development, and translation into the Lithuanian language of general purpose and educational software, which is necessary for schools, are centralized.
5. Decentralization of school provision with necessary hardware and general-purpose software is provided in the programs.
6. Schools are supplied with modern hardware and other equipment.
7. The programs provide various ways of accounting; encourage mutually beneficial forms of communication between educational institutions and information-technology companies.
8. Teachers are provided with conditions to acquire basic technology and information literacy in their own or adjacent school.
9. Municipalities are encouraged to fund the implementation of the programs from their own sources.

The Role of Municipalities and the Main Principles of ICT Implementation

1. Local community shall participate in the computerization of schools.
2. Municipalities evaluate ICT projects and allocate funds and other ICT resources for schools.

The Main Principles of the School Activities

1. School communities discuss and prepare ICT implementation projects.
2. ICT implementation at school is carried out according to the programs developed by their communities.
3. School ICT implementation projects are evaluated and specified every year.

D. Evaluation

When the strategy will be implemented, it will be possible to see this result:

I. The relationship between society and education:

- Schools and local municipalities will involve actively to implementation of ICT;
- Schools will organize experiment of ICT;
- The school libraries services and functions will be expanded;
- Schools' computers classes and Internet will be open for all regional people.

II. Contents and methods of education:

- Information and technology of literacy standards for general education school will be done;
- Universal curriculum, which integrate information and technology of literacy in the contents of general education will be developed;
- Methodological proposals on how to integrate ICT into various subjects will be presented.

III. Provision of computer equipment and teaching aids:

- The ratio of one computer per ten students will be achieved;
- Special schools will be provided with special technology;
- School libraries working place will be created, libraries automation software will be provided, too;
- Regional teachers information and in-service training centers will be expanded (modernized, to set up distance education classes), all local municipalities recourse center will be created;
- Internet and Intranet will be installed in most schools;
- Main school software will be maintained and translated into the Lithuanian language;
- Several teaching aids will be adopted from foreign aids and several tens will be created.

IV. The role and qualifications of the teacher

- Information technology of literacy standards for teachers, school librarians, ICT co-coordinators will be created.
- Necessary conditions for all teachers will be created, too.

V. The union between education and science

- The Lithuanian research institutions and universities and individual scientists will actively participate in implementing ICT in education

VI. Management and funding of ICT implementation

- Documents which regulate management and funding of ICT implementation in education will be prepared and approved

The task sheet for the homework

Please indicate by ticking (✓) the cells your national/regional priorities.

Country/region: Russian Federation

	Short-term (1-2 years) plans		Long-term (3-5 years) plans	
	Producing	Updating / Revising	Producing	Updating/ Revising
Rationale & Aims		+		+
Objectives		+		
Methods of implementation	+			
Funding plan		+		
Quality Assurance and Evaluation, Indicators				
Focus on primary phase				
Focus on secondary phase	+			
Focus on tertiary phase			+	
Focus on adult education				
Special needs				
Curriculum & pedagogical development				
ICT as a subject		+		+
ICT across the curriculum	+			
Vocational ICT training		+		+
Software				
Generic software tools				
Subject specific software and digital materials	+	+	+	+
Localising, versioning, licensing	+		+	

Production, delivery, updating and use	+	+	+	+
Capacity building				
- Pre-service teacher education		+		+
- Staff development		+		+
Support				
- Technical		+		+
- Pedagogical		+		+
- Media design		+		+
Technical infrastructure				
Hardware	+			+
Local-area networks	+			+
Wide-area networks (Internet)	+			+
Management				
- national level		+		+
- local level		+		+
- institutional level		+		+
Quality Assurance, Inspection		+		
Research	+		+	
Student assessment		+	+	
Other, please, specify				

Notes for summarizing

Main aspects	Core problems <i>principles</i>	Main problems and "bottle necks"	Ways of overcoming, success practice	Recommendations	Other comments
Political, economic and social conditions for integrating ICTs into education	<i>fairly clear targets</i>	<i>role of schools in implementation</i>			
Technological conditions for integrating ICTs into education					
Pedagogical aspects					
Ethical aspects					
Teacher aspects	<i>come first!</i>				
Funding and fundraising	<i>foreign support</i>				
International and cross- national co-operation					
Other aspects					

Notes for summarizing

Main aspects	Core problems principles	Main problems and "bottle necks"	Ways of overcoming, success practice	Recommendations	Other comments
Political, economic and social conditions for integrating ICTs into education					
Technological conditions for integrating ICTs into education					
Pedagogical aspects	pre-University only C-S + W/P 820 ie 60% 1450	see 6.1.3 lack of clarity	clarify nature of content		
Ethical aspects					
Teacher aspects					
Funding and fundraising					
International and cross-national co-operation					
Other aspects		Lead player?			

The task sheet for the homework

Please indicate by ticking (✓) the cells your national/regional priorities.

Country/region: Moldova

	Short-term (1-2 years) plans		Long-term (3-5 years) plans	
	Producing	Updating / Revising	Producing	Updating/ Revising
Rationale & Aims	✓	✓	✓	✓
Objectives	✓	✓	✓	
Methods of implementation	✓			
Funding plan	✓			
Quality Assurance and Evaluation, Indicators		✓		
Focus on primary phase			✓	
Focus on secondary phase	✓	✓		
Focus on tertiary phase	✓			
Focus on adult education			✓	
Special needs			✓	
Curriculum & pedagogical development				
ICT as a subject			✓	
ICT across the curriculum	✓			
Vocational ICT training			✓	
Software	✓		✓	

Generic software tools			√	
Subject specific software and digital materials			√	
Localising, versioning, licensing			√	
Production, delivery, updating and use			√	
Capacity building				
- Pre-service teacher education	√		√	
- Staff development		√	√	
Support				
- Technical			√	
- Pedagogical	√		√	
- Media design	√		√	
Technical infrastructure				
Hardware		√		
Local-area networks	√			
Wide-area networks (Internet)	√		√	
Management				
- national level	√		√	
- local level	√	√		
- institutional level	√			
Quality Assurance,	√		√	

Inspection				
Research			√	
Student assessment		√	√	
Other, please, specify				

National programme for informational
and communicational technologies implementation in education
for the period 2001-2005

1. General overview

The economical, social and political statement in Republic of Moldova, international standard direction trends, the need in co-ordination of educational and social-economical reforms entails the structural and functional mechanisms revising of the existent educational system, introduction of some new planning, organising, management, financing and assessment methodologies in education. The above mentioned functions impose the introduction of Informational and Communicational Technologies (ICT) into the educational system that would allow to reply to the continuous changing of social needs in the framework of an educational paradigm.

2. The present statement

For the achievement of educational system reform objectives incurred in the Educational Development State Programme, both in short and long term periods, one of the basic priorities is the development of educational management that would be unachievable without a real and operative monitoring of each and every level. This would guarantee an effective informational flow for decision making and ICT introduction into the educational process for most of the subjects. This way, simultaneously with the educational informatization, it is more and more emphasised the fact that the existent equipment will be used more effectively for educational management materialisation and quality assurance.

Nowadays, the educational system reform in the republic confronts a series of obstacles that refers to:

- Absence of an organised on ISCED – 97 data base;
- Limited possibilities in receiving, processing and forwarding of data;
- Absence of an efficient distant education system evaluation;
- The educational units and education directions in the counties don't have access to both, inner - methodical and scientific information and external - Internet resources, that would allow using various databases, libraries, museums, etc.
- The public doesn't have real possibilities to access any kind of information that will lead to participative education creation as well as to transparency of educational system functioning (structures, costs, admission, national examination results, etc.);
- There are not any conditions for distant learning programmes.

Taking into account the fact that the pupils and students that have concluded and graduated the republican educational institutions will have a different career from that possessed by the majority, the teachers, parents, enterprise managers and those who promote the state politics know that it is necessary to implement a new training model based on new informational technologies. These technologies can influence the educational system reforms and shape new teaching methodologies, excluding the distance between the school and society by promoting new teaching, studying, assessment, and management technologies.

On the first stage of informatics implementation in the Republic of Moldova, the informational tools had been applied into old educational methodologies. The computers were used for simple solutions such as word processing.

The second stage started much later (the end of '90) and is characterised by communicational devices introduction. Consequently, the school position in the society has raised through networking the school and social institutions. The new school model emphasises on group study based on communicational technologies.

One important event in the national educational system informatization was the Educational Institutions' Computer Equipping Project aimed generally to pre-university institutions and some universities. The delivery of computers for 885 classes on leasing terms with the total cost of US\$ 23,5 million was concluded with an American corporation, Hewlett Packard. Every class includes 10 workstations connected to one server in a local network, a printer, and a modem. The computers are used for informatics classes in pre-university institutions and plus some specific activities in colleges and universities.

Hence, the present situation in the Republic of Moldova in informational technologies implementation can be described as it follows:

- 820 pre-university institutions (from 1450) are equipped with computers, basically used for computer science classes;
- Eight % of pre-university institutions have access to Internet. Hence, in the lack of LAN or modem connection, almost no schools have access to educational, scientific and cultural resources on republican and global level. The situation is different in university institutions, most of them having access to Internet;
- In the absence of informational technologies, the position of teacher in schools continues to be of a "knowledge transmitter". The teachers don't have the possibility to improve their teaching level in the framework of new informational technologies and to move to a "knowledge navigator" call;
- In the republican schools there weren't used all the multimedia devices that would allow to create presentations in a real environment combining video, audio, graphical and textual information for different subjects such as physics, chemistry, biology, etc.
- Educational system in Moldova does not have a computer network that would lead to the development of distant education programmes.

3. General objective

The general objective of the Programme aims to the creation of juridical, managerial and curricular framework for state educational politics of ICT implementation.

4. Specific objectives

- Education development on ICT basics (contents, educational technologies, educational management);
- Initial training, improvement and re-qualification of didactical personnel, gained experience systematisation at national, county, educational institutions, pilot-institutions, school communities and different projects levels in ICT area;
- Providing of scientific and methodical support in educational system and didactical technology area based on ICT. Strengthening connections with the society, mass-media, non-educational organisms and parents, multi-channel financing creation;

- Accomplishment of existent resource analysis in Moldova, approval, selection, licensing, adjustment and elaboration of ICT programmes;
- Programme elaboration for ICT substructure development;
- Normative base development (educational planning, staff, remuneration scales, timetable organisation for teachers who use ICT, ICT co-ordinators, health and hygienic standards for equipment installation and use, ICT use regulations, ICT instruments transfer and discount, communicational resources, accessories and consumption wares, tax facilities, etc.).

5. Achievement stages

Programme achievement terms – 2001-2005

First stage (2001-2002)

Programme projecting and management structures creation. Elaboration of programmes, educational plans and didactical materials in order to improve and re-qualify the teaching staff. Basic information resources creation including Internet. Providing main institutions in the Programme with informational and communicational devices following the established priorities. Creation of central resource network, support institutions and technological support system.

Second stage (2003-2005)

Providing education institutions with ICT instruments and organisation of access to informational resources following the Programme priorities. Creation of a ground for a unique informational and educational framework development and Programme sustainability assurance.

6. Programme's priorities

6.1 ICT based educational development

ICT implementation is a priority in educational development and it is necessary to ensure a qualitative and efficient educational process in order to achieve priority objectives in education and to enlarge the access to education for youth.

Informatization represents the essential constituent for education reform, content and didactical technology's development, strengthening the school's role and educational management improvement.

6.1.1 Education content. Informational and communication competencies.

Nowadays, ICT are approached as basic alphabetisation of competencies. Informational and communicational competence from the most progressive model schools are used in the entire didactical process, for different subjects, training, and education forms. Informational competence includes abilities to:

- Process independently the information (gathering, selection, analysis and assessment, organisation, presentation and forwarding);
- Object and process moulding and projecting, personal plans materialisation;
- Decision making and operation in unusual statements, life-long studying;

Informational processing includes:

- Using ICT in operation;
- All types of informational objects – texts, numerical data, sounds, static and dynamic images, etc.

6.1.2 School role. Open education.

One of the main trends and expectation of education development is aimed to open education that implies opening toward:

- Educational resources;
- Didactical position, form and technologies;
- Individual training channels in the educational system's framework;
- Interaction with society's structures and individuals (parents, tutors, consumers, and other educational institutions).

6.1.3 ICT use in educational process

Nowadays, it is possible to use ICT in an efficient way by all actors from education through the following forms:

- Informational object creation and development that will correspond to the educational process needs;
- Object and material and informational processes research that lead to informational object achievement – descriptions, models, conclusions, etc.;
- Object and process projection and attainment on the demand, task and description basis;
- Technical competence development;
- Foreign language study;
- Training results control, monitoring and assessment on behalf of computerised procedures;
- Unique informational framework interaction “pupil – teacher – parent – administration - society”;
- Distant consulting, methodical support, improvement, re-qualifying, initial staff training;
- Educational process and special needs for children;
- Educational institution's management;

6.2 Human resources

6.2.1 Management unit

The managers' role in the process of ICT implementation is very important because informatization is connected to the entire process of educational development. Therefore, the success of informatization is guaranteed just in case when educational system managers at all levels have a clear idea of education development. This idea has to be accepted by entire staff in informational resource centres, methodical centres, managers, and workers in all educational institutions.

6.2.2 ICT co-ordinators

ICT co-ordinators have an essential role in informatization process being direct organisers and participants to:

- Programme elaboration activities for educational units' informatization;
- Programme attainment co-ordination, monitoring of service, repair, technical devices' update, consumables' covering;
- Educational institutions' staff training in ICT use area;
- Institution and society connection, management structures in ICT area;

6.2.3 Informatics teachers

Nowadays, the main users of ICT users are informatics teachers. Now, it is very difficult for them to become ICT co-ordinators because of many factors. Hence, there is an objective trend to enlarge informatics teachers' statute to an ICT co-ordinator.

6.2.4 Scholar subject teachers – ICT's methodologists

Poor actual practice of ICT use in studying is due to teachers' activities at different subject. It is necessary to ensure the experience sharing to other teachers, to use this methodical resource and remunerate the methodological work.

6.2.5 Assistants

For an efficient use of the equipment, it is reasonable for it to work 10 – 12 hours a day. For this purpose, it is necessary to ensure the technical support of an assistant.

6.2.6 Methodological support, training, re-qualification and initial staff training

ICT implementation is impossible without methodological support, training, re-qualification, and staff formation that are linked to the complex informatization's aspects included into the entire education reform. Training is important because a part of informatics teachers is not direct professionals or does not have pedagogical degree. Training and re-qualifying courses will emphasise practical and projection aspects of ICT.

6.2.7 Selection and certifying the staff

Staff selection for building an informational environment in education is a complex problem. Most of the teachers do not have enough experience in working with ICT instruments and are not so competent to start doing it. On the other hand, computer oriented staff does not have a clear idea of education. Therefore, simultaneously with the training and re-qualifying of ICT co-ordinators and other actors, appears the certifying problem for them. It should be mentioned that in this area we have the experience from certifying teachers that had to gain some competence in using computers for the teaching subjects.

6.3 Programme's organisational and methodological assurance

Programme attainment requires a general idea about objectives and ways of development, support from education actors, management structures, parents and mass-media. Organisational and methodological assurance of the Programme entails its elaboration, co-ordination, and implementation analysis at every level (educational institution, locality, county, nation-wide) and the establishment of competencies and responsibilities for every level.

6.4 Informational environment and training resources' development

An efficient use, in educational purposes, of the equipment is possible just in case of supplying them with informational resources. The lack of informational resources that would correspond to the equipment makes impossible to follow this priority. We may consider as informational resources the following wares: system software, informational data, designing software, e-books, informational and managerial applications, etc. Following the educational system's priorities, informational resources have distinct priorities. From the educational point of view, the most important are informational data and design software.

6.5 Education institutions' assurance with ICT equipment and tools

6.5.1 Equipment

- Informational processing tools – computers;
- Visual and sound creation applications;
- Visual and sound input tools;
- Data recording tools;
- Information output tools;
- Computer controlled tools;
- Communicational tools and networks;
- Mobile and stationary audio and video equipment;

6.5.2 Communicational infrastructure

Data exchange channels – ensures educational institutions' access to the training, educational and managerial resources;

Educational servers – supports educational resources and contributes to access the local and global informational resources;

Data access systems – sets educational actors' access to different network information;

6.6 Legislative and normative framework

ICT Programme implementation entails some legislative and normative changes in the existing law. An effective use of the equipment entails modifications in remuneration system and introduction of ICT co-ordinator units. An insufficient stress of the equipment will lead to a much-accelerated moral depreciation than a physical one. In these means, it is necessary to examine the moral depreciated equipment utilisation and discounting that would still be functional. This leads to the re-examination of computing equipment normative applied in educational process.

6.7 Educational management informatization

The educational management system includes standard technical instruments and specialised informational resources:

- Specific software for data bases, accounting, file transfer;
- Educational system's data – documentation, staff, pupil/student cohort, institutions (economical, pedagogical and social indexes);
- Upper system connection and co-ordination;

7. General finalities

After the Programme's implementation will be created a unique informational environment in order to reach the following objectives:

- Education quality improvement through ICT provided help;
- Computer use by all teachers and students, ICT co-ordinator presence in majority of schools, a computer for every institution leader and library, county educational directions and schools network creation;
- Premises to open education models including: equal access to education, educational programmes' differentiation and individualisation, main educational problem solving (children with special needs, local and global access to informational resources for pupils);
- Methodical support system creation for educational institutions' staff, training and re-qualification in ICT area for 50% from pre-university institutions and 80% from vocational education teachers;
- Pilot institutions' substructure creation for the Programme;
- Facilities for children with educational specific requirements to obtain full education and social accommodation for them;
- Talented children search, evidence and activity through ICT use and their connection to the teachers and scientists;

8. Programme's Management

One of the main conditions in Programme's implementation is the involving of all educational actors and organisations, starting with a certain subject teacher, and finishing with the Ministry of Education. The projecting process is a mechanism that would allow educational institutions enrolment into the Programme. Methodological and managerial structures as well as the resource centres will continuously analyse the Programme's implementation at educational institution, county and state level. A co-ordination council, established through a Governmental Decision will control the Programme's elaboration and implementation. In the Ministry of Education will be created a task group that will comprise all the required structural levels. Also, will be created Co-ordination Councils on county level.

9. Evaluation and monitoring

The initial, current and final evaluation of the Programme will be accomplished on ICT based complex indexes in pedagogical, economical and social aspect.

To have an objective evaluation of the Programme, it is required to make a study and corrections in the ICT implementation process that would include monitoring activities such as standardised analysis and testing concerning:

- Intellectual development of the pupils;
- Cohort dynamics in ICT applying;
- Teaching quality;
- Learning quality;
- Teaching quality of graduates;
- Labour force access of graduates depending on ICT attainment level;
- ICT use efficiency in educational management;

The analytical materials periodically generated by a special service – ICT Programme's Implementation Monitoring – will be available for interested structures and will allow any correction of the Programme's implementation process.

10. Programme's performers

Ministry of Education, Ministry of Telecommunications, Educational Science Institute, New Informational Technologies Centre, the universities, colleges, county educational directions, town-halls, NGOs, economical agents, etc.

11. Programme financing system

One of the Programme's success parameters is the efficient use of material and financial resources following the bellow mentioned principles:

- Target financing, corresponding to the educational institutions development requirements;
- Institutions' financing on individual programmes' basis;
- Equality between different area oriented resources (supplementary didactical task for the staff, training and re-qualification programmes, computing, other informational technology's tools (including audio and video), ICT based training and methodical complexes (informational resources, technical service, repairing, updating, accessories));
- Multi-channel financing, investment projects, grant programmes and funds, etc;
- Including expenses into budget (expenses before programme implementation, current expense distribution, efficiency);
- International programmes connection – UNESCO, TACIS, etc.

Analysis of the State of Informatization of Education in the Republic of Tatarstan

The education of new type, an informational education, is being created in Russia and in the republic of Tatarstan as in the world in the whole. The draft of the federal special purpose program "Development of the common educational environment for the years 2002-2006" specifies the following stages of the process:

1. development of the issue of the content of the comprehensive education in the conditions of advanced access to information
2. development of the software and information provision for the subjects under the study databases
3. development of the digital multimedia training, diagnostic and normative materials for the subjects under the study, that are found necessary for the methodical provision for all educational stages
4. development of digital network training, diagnostic and normative materials for the subjects under the study, that are found necessary for the methodical provision for all educational stages
5. organization of the system of distance education
6. organization of the simulation grounds for complex development of the models of informatization of education
7. staff development, professional training and upgrading for educators, executives and engineers
8. providing the educational institutions with informatization means
9. creation of a common educational information environment
10. creation of the service center

Since the 1997 the republic of Tatarstan has been working at the informatization of the education. The work has been based mainly on federal program :

1. the conception of the informatization of education has been developed and adopted in Tatarstan (22.02.2001 г.)
2. since the 1997 the republican educational experiment has been carried out. It's aim is to define the structure and content of the common informational education, it consists of the content aspect (the program of common informational education, experimental manuals and materials, also in a digital version) and of the staff aspect (staff upgrading for informatics teachers in the comprehensive school, creation of a multistage system of upgrading for informatics teachers)
3. Organization of simulation grounds in 10 districts of the republics of Tatarstan for complex development of the model of informatization of education (Order of the Ministry of Education of the republic of Tatarstan from 22.02.2000)

4. According to the command of the Council of Ministers of the republic of Tatarstan №1474-p from 14.12.2000 and the Commission of the RF President Putin all computer classes of the republic are provided with computers.

MA

TATAR STAN

Notes for summarizing

Main aspects	Core problems principles	Main problems and "bottle necks"	Ways of overcoming, success practice	Recommendations	Other comments
Political, economic and social conditions for integrating ICTs into education					
Technological conditions for integrating ICTs into education					
Pedagogical aspects	Evolution of computer aids & programmes aids				
Ethical aspects					
Teacher aspects					
Funding and fundraising					
International and cross-national co-operation					
Other aspects	AI ?				

Whole paper hardly relevant

The task sheet for the homework

Please indicate by ticking (✓) the cells your national/regional priorities.

Country/region: Russia Tatarstan

	Short-term (1-2 years) plans 1		Long-term (3-5 years) plans	
	Producing	Updating / Revising	Producing	Updating / Revising
Rationale & Aims		✓		✓
Objectives		✓		✓
Methods of implementation		✓		✓
Funding plan		✓		✓
Quality Assurance and Evaluation, Indicators		✓		✓
		??		
Focus on primary phase		✓		✓
Focus on secondary phase		✓		✓
Focus on tertiary phase	✓			✓
Focus on adult education		✓		✓
Special needs	✓			✓
Curriculum & pedagogical development				
ICT as a subject		✓		✓
ICT across the curriculum		✓		✓
Vocational ICT training	✓			✓
Software				
Generic software tools		✓		✓
Subject specific software and digital materials	✓		✓	
Localising, versioning, licensing	✓		✓	