



UNESCO at the  
World Summit on the Information Society (WSIS)

# Towards **Societies**

Geneva, Switzerland  
10-12 December 2003

## EDUCATION AND KNOWLEDGE SOCIETIES

*Round Table Discussion*

*11 December 2003*

UNESCO Institute for Information Technologies in Education





UNESCO at the  
WORLD SUMMIT ON THE INFORMATION SOCIETY (WSIS)

# Education and Knowledge Societies

## ROUND TABLE DISCUSSION

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The authors are responsible for the choice and the presentation of the facts contained in this publication and for the opinions expressed therein, which are not necessarily those of UNESCO and do not commit the Organization.

Published in 2003  
by the UNESCO Institute for Information Technologies  
in Education

8 Kedrova St. (Bld. 3)  
Moscow 117292  
Russian Federation

Printed in the Russian Federation

# Towards Knowledge Societies

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<b>TITLE</b>	<b>EDUCATION AND KNOWLEDGE SOCIETIES</b>
<b>TYPE</b>	ROUND TABLE DISCUSSION
<b>DATE</b>	11 December 2003
<b>TIME</b>	9:30 – 13:00
<b>PLACE</b>	Geneva Palexpo, Room C
<b>ORGANIZER</b>	UNESCO Institute for Information Technologies in Education (IITE)
<b>PARTNERS</b>	Club of Rome (CoR) International Federation for Information Processing (IFIP) International Council for Open and Distance Education (ICDE) International Association of Universities (IAU) University of Mauritius, Virtual Centre for Innovative Learning Technologies (VCILT) and Lifelong Learning Cluster (LLC) Food and Agriculture Organization of the United Nations (FAO) NGO-UNESCO Liaison Committee

The event aims at attracting the attention of the Summit Stakeholders to the significance of education in the construction of knowledge societies and tasks of education in knowledge societies. Recent undertakings in the field of ICTs being a vehicle to develop Education for All, as well as cooperative efforts of UNESCO and NGOs building up education for and in knowledge societies will be reviewed.

The participants in the Round Table discussion (decision-makers and policy-makers in education, representatives of UN agencies and NGOs, educators, scientists and students) are invited to identify principles and recommendations, which can help the world community meet the challenges of knowledge societies.





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## AGENDA

<b>9:30</b>	Opening of the Round Table “EDUCATION AND KNOWLEDGE SOCIETIES”	<b>Mr John Daniel</b> , UNESCO ADG/ED; <b>Mr Vladimir Kinelev</b> , Director, UNESCO IITE
<b>SESSION I</b>	<b>“Education for Knowledge Societies: Trends, Challenges and Policies”</b>	<i>Chair and moderator:</i> <b>Prof. Bernard Cornu</b> (France), Director, La Villa Media – the European Residence for Educational Multimedia; Vice-Chairman of the IITE Governing Board
	General introduction	<b>Prof. Bernard Cornu</b>
<i>Paper 1</i>	<i>Education and Knowledge Societies</i>	<b>Mr Valdas Adamkus</b> (Lithuania), UNESCO Goodwill Ambassador for the Construction of Knowledge Societies; Former President of the Republic of Lithuania
<i>Paper 2</i>	<i>Knowledge Sharing and International Cooperation in Science Education</i>	<b>Dr Yu Wei</b> (China), Director, Research Center of Learning Sciences, Southeast University; Vice President of China Association of Science and Technology; Former Vice President of All China Women’s Federation; Former Vice-Minister of Education of the People’s Republic of China
<i>Paper 3</i>	<i>ICTs as an Innovator for Sustainable Development</i>	<b>Prof. Raoul Weiler</b> (Belgium), Professor, University of Leuven; Member of the Executive Committee (International) of the Club of Rome (CoR)
	Debate	Audience
<b>10:35</b>	<b>SESSION II “Education in Knowledge Societies: Strategies, Tools, Teaching and Learning”</b> (During the session: video link with the International Conference on Open and Online Learning organized under UNESCO's sponsorship in Mauritius)	<i>Chair:</i> <b>Prof. Bernard Cornu</b> <i>Moderator:</i> <b>Prof. Raymond Morel</b> (Switzerland), Director, Geneva Educational Technology Centre (CPTIC)
	General introduction	<b>Prof. Raymond Morel</b>
<i>Paper 1</i>	<i>Education for Knowledge Societies: Learning to Work with Insecure Information &amp; Communication Technologies</i>	<b>Prof. Klaus Brunnstein</b> (Germany), President of the International Federation for Information Processing (IFIP)
<i>Paper 2</i>	<i>Teacher’s Training: Central Challenge for Knowledge Societies</i>	<b>Prof. Bernard Loing</b> (France), Intergovernmental Liaison Officer and General Delegate of the International Council for Open and Distance Education (ICDE) at UNESCO



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<i>Paper 3</i>	<i>Lifelong Learning in the Knowledge Society: Is There a Role for Higher Education?</i>	<b>Drs. Tom van Weert</b> (The Netherlands), Chair "ICT and Higher Education", Professional University of Utrecht
<i>Presentations on Lifelong Learning</i>	<i>Facilitating Lifelong Learning in Universities: the Role of ICTs</i>	<b>Dr Claudine Langlois</b> , Director, International Association of Universities (IAU)/UNESCO Information Centre on Higher Education
	<i>Technology-Enhanced Education, Open Educational Resources and Non-formal Approaches to Lifelong Learning for Sustainable Development</i>	<b>Prof. Alain Senteni</b> (Mauritius), Director, Virtual Centre for Innovative Learning Technologies (VCILT), University of Mauritius (via video link)
	<i>Open Educational Resources</i>	<b>Dr Sally M. Johnstone</b> (USA), Executive Director, Western Cooperative for Educational Telecommunications (WCET), Western Interstate Commission for Higher Education (WICHE) (via video link)
Debate		Audience
<b>11:50</b>	<b>Session III "UNESCO as a Key Actor in the Development of Education for and in Knowledge Societies"</b>	<i>Chair: Prof. Bernard Cornu</i> <i>Moderator: Prof. Peter Bollerslev</i> (Denmark), Director and Editor-in-Chief at SAXO Publishers
General Introduction		<b>Prof. Peter Bollerslev</b>
<i>Paper 1</i>	<i>The Challenges for Education and Knowledge in the Information Society</i>	<b>Mr Blagovest Sendov</b> (Bulgaria), Ambassador of Bulgaria to Japan; Former President of Parliament of the Republic of Bulgaria
<i>Paper 2</i>	<i>FAO-UNESCO Partnership on E-learning for Information and Knowledge Management</i>	<b>Dr Anton Mangstl</b> , Director, Library and Documentation Systems Division, Food and Agriculture Organization of the United Nations (FAO); <b>Dr Stephen Rudgard</b> , Chief, WAICENT Outreach, Library and Documentation Systems Division, FAO
<i>Paper 3</i>	<i>ICTs in Knowledge Societies: a Tool for Access, Equity and Quality</i>	<b>Mrs Monique Fouilhoux</b> , President of the NGO-UNESCO Liaison Committee, President of the International NGOs Conference
Debate		Audience
Discussion and adoption of the final document		<b>Prof. Bernard Cornu</b>
Closure of the Round Table		<b>Mr John Daniel</b> , <b>Mr Vladimir Kinelev</b>
<b>13:00</b>	End of the Round Table	



## DANIEL, John

Assistant Director-General for Education, UNESCO (2001 – Present)

**Field:** International educational administration

**Professional Career:**

- 1990 – 2001: Vice-Chancellor, The Open University, UK
- 1984 – 1990: President, Laurentian University, Canada
- 1980 – 1984: Vice-Rector, Academic, Concordia University, Canada
- 1978 – 1980: Vice-President, Athabasca University, Canada

**Educational Background:**

- 1996: Master's degree (Educational Technologies), Concordia University, Canada
- 1969: Doctoral degree (Physical Sciences), University of Paris
- 1965: Undergraduate degree (Metallurgy), Oxford University

**Born:** 1942



On behalf of my colleagues in UNESCO's Education Sector around the world it is a pleasure to welcome you to this Round Table discussion on Education and Knowledge Societies. UNESCO believes that our aim must be to evolve, in reality not in mere terminology, from information societies to knowledge societies. Then the ultimate goal for the whole world is to become a learning society with the purpose of bringing peace, prosperity and fulfillment to the humankind. We are still in the early stages of this process – indeed, we often talk of information and communication technologies (ICTs) as new technologies. For this reason I am less exercised than many observers about the digital divide. While the richer countries may be better equipped than the poorer countries, all are at much the same stage when it comes to using ICTs in education. Various parts of UNESCO's Education Sector, notably our Institute for Information Technologies in Education in Moscow and our Regional Bureau for Education in Bangkok, are following these developments closely with the intention of allowing all countries to share the benefits. I hope that you enjoy the discussions at the Round Table.

## KINELEV, Vladimir

Director, UNESCO Institute for Information Technologies in Education  
(UNESCO IITE) (1998 – Present)

Professor

Academician of the Russian Academy of Education

Academician of the Russian Academy of Engineering



**Field:** Information and communication technologies in education, educational administration, space technologies

### Professional Career:

- 1996 – 1998: Minister of General and Professional Education of the Russian Federation
- 1993 – 1996: Chairman of the State Committee of the Russian Federation on Higher Education, Vice-Chairman of the Russian Government
- 1990 – 1993: First Deputy Minister of Science, Higher Education and Technologies of the Russian Federation
- 1972 – 1990: Assistant Lecturer, Assistant Professor, Professor, Vice-Rector, Moscow State Technical University n.a. Bauman

### Educational Background:

- 1982: Doctoral degree (Dr. Sc. – Space Technologies), Moscow State Technical University n. a. Bauman
- 1972: Doctoral degree (Ph.D. in Technical Sciences), Moscow State Technical University n. a. Bauman
- 1968: Master's degree (Space Technologies), Moscow State Technical University n. a. Bauman

**Born:** 1945

## EDUCATION FOR EVOLVING SOCIETIES

*'Education is a truly special State, the influence of which cannot be defined by single person, and even national authorities are unable to delimit its frontiers: the sphere of its influence is immense, it is infinite...'*

Ch.M. Talleyrand

### Globalization and the Main Trends in Education for Evolving Societies

The World Summit on the Information Society is taking place in the period marked by an active phase of intensified globalization process which includes not only economics and finance, but virtually all spheres of human activity. The development of new information and communication technologies transgresses the territorial borders of national states and makes geographical boundaries inadequate as delineations of jurisdictions. These technologies constitute a truly international and global realm of activity, where it is practically impossible to successfully impose national laws and regulations. Information and communication technologies based on the Internet, telecommunication networks and intelligent computer systems open up new and exciting opportunities for new generations and for dissemination of knowledge across national borders. They give us an opportunity to speak about global knowledge above and beyond local and indigenous contexts. It is cross-cultural, characterized by the diversity of sources, grounded in global information infrastructure, and depends on the following global domains of human activity: science and technology; politics and economics, humanities, social sciences, culture and education.



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Globalization process coincides with a fundamental transition to the information society – a new worldwide community based on information. Evolvement of the information society entails dramatic changes in production and business, as well as in a broader social context. Rapid development of the information sphere of society is drastically altering the structure of work and employment, and produces new occupations and jobs. More and more people are being drawn into the information society as learners, workers and consumers. People all over the world have high hopes that new technologies will lead to healthier lifestyles, greater social freedoms, increased knowledge and more productive livelihoods. It will not be an exaggeration to say that future generations will face the challenge of adjusting to a new social environment, where information and scientific knowledge will replace matter and energy as pivotal factors and will define both society's strategic potential and prospects for its development.

Scientific and technical progress and the global dissemination of technologies developed in the most advanced countries of the world constitute one of the main arguments in favour of the leading role played by education in the 21st century. The level of technological development is indicative nowadays not only of the economic power and living standards of a particular country, but also of the place and role of this country in the global community and the scope and prospects of its economic and political integration with the rest of the world. At the same time, the level of development and usage of modern technologies in different countries is determined not only by the development of their material resources, but, to a large extent, by the degree of society's ability to produce, consume and apply new knowledge. These developments, in turn, are closely linked to the level of educational development. All these processes are largely driven by information and communication technologies, where scientific knowledge and information increasingly determine new patterns of growth and wealth creation and open up possibilities for more effective poverty reduction.

In spite of the fact that at the turn of the century literacy for all – children, youth and adults – is still an unaccomplished goal and an ever-moving target, all of us should concentrate on the next steps towards creating information society. New social demands and the new world around us shaped by the new information technologies and models of action call for New Literacy for the Information Society. As a substitute for the old meaning of basic literacy (reading, writing and arithmetic), new ones may be presented as finding information by searching written sources, observing, collecting, recording, etc.; communicating in hypermedia and involving all types of information and media; designing objects and actions; creating hypermedia essays on the basis of all types of information technologies.

The great saga of human knowledge contains pages that are unique, and I would first list among them those, which contain examples combining the potentials of the human mind and technology. The invention of printing raised the institutions of general education to a previously unattainable height. It is the first and perhaps the highest ever stage in the information revolution. But I presume that it will not be an exaggeration to contend that considering the amazing standards and prospects of application offered by information and communication technologies in education, we are on the threshold of the next stage of the educational revolution, which will entail a dramatic shift in all spheres of human existence.

## ***Education for the Information Society***

The Report of the International Commission on Education for the 21st Century 'Learning: The Treasure Within' submitted to UNESCO emphasizes the crucial role of fundamental and thorough knowledge in allaying some major tensions which, although far from being novel, will pose a formidable challenge in the 21st century. These tensions include: the tension between the global and the local, the universal and the individual; between tradition and modernity. The tension between, on the one hand, the necessity of competition, and on the other hand, the concern for equal opportunities; the tension between the extraordinary expansion of knowledge and human beings' capacity to assimilate it.

Leaders of virtually all countries striving to prepare their citizens for adequate response to the challenges of the 21st century have professed their desire to transform their countries into learning economies and learning societies, inasmuch as the information society needs competent and knowledgeable citizens. The age of new information and communication technologies does not eliminate the most difficult problems that the world of education is facing today and that have to be resolved irrespective of whether the new technologies are adopted or rejected. Nevertheless, training and development, social and professional requirements, globalization of communication, economy, and political projects for building a new society, rely heavily on the introduction of information and communication technologies into education. The alternative is to lag behind these developments chronically and, in effect, to fail to meet the challenges of the 21st century.



Presently, most governments put tremendous efforts in modernizing educational systems in their countries on the basis of information and communication technologies viewed as a key to such modernization. Some countries consider information and communication technologies as a vital component in upgrading the quality of education through changes in curricula, introduction of training in new skills and a wider scope of knowledge. In other countries information and communication technologies are used mainly to facilitate access to education by various population groups or for a narrower purpose of assisting self-education through programmes broadcast on radio and television. Yet other countries emphasize their reliance on technologies as a means of transforming educational environment or satisfying specific needs of different categories of students.

Education for emerging information society requires information and communication technologies to meet large-scale learning needs arising from social and economic developments. For the first time in history, information and scientific knowledge are not simply means of improving society, but are becoming the main products of the economy. Moreover, knowledge is the main asset and the main product of the information society upon which continuation of economic well-being and societal development depends. Information and communication technologies are at the core of this development. Information and communication technologies and the information society are both dealing with creating, acquiring, and sharing, disseminating, delivering, aiding and appreciating knowledge. Information and communication technologies serve as the means of providing access to learning and assisting in continuous learning process necessary for successful integration of all population groups into information society.

### ***Education in the Information Society***

Learning issues are of central importance to the evolving information society. Developing information and communication technologies create an environment of rapid and ongoing changes. The current pace and magnitude of changes breaks the traditional framework of historical gradations. For the first time in the history of our civilization, generations of products and ideas come and go faster than generations of people succeed one another. Even in private life, change tends to oust continuity and stability. Moreover, change reveals itself through previously unparalleled diversity, making it impossible to define our era through any single event or development. This environment demands a fundamentally new approach to learning. Individuals need new skills and understanding; they must develop the ability to continuously improve these skills and understanding. In other words, humanity must embrace and promote a culture of lifelong learning. New information and communication technologies exceed the traditional framework of the learning process. Learning can no longer be viewed as a ritual that one performs only in the earlier part of life. Information and communication technologies are being used to cross the barriers of age, time and space, bringing lifelong learning to all. People of all ages, in all places and in all different environmental contexts are learning all the time. Therefore, regardless of what activities they are performing — they comprise the learning society.

The amazing standards and prospects of applicability offered by information and communication technologies in learning and teaching processes show that humanity is on the threshold of a new stage of educational revolution which will entail a dramatic shift in all spheres of human existence. These circumstances and new social demands, the new world community shaped by the new information and communication technologies and activities call for a new literacy in the information society. The new literacy requires, in principle, creating of new technology for obtaining scientific knowledge, new pedagogical approaches and new school curricula and methodology for teachers and students. All of the above should stimulate students' intellect and creativity and enable them to develop a holistic view of the world that would allow them gaining a foothold in the information society. Thus, it will be a mistake to think that applying new information and communication technologies would automatically raise the quality of education. In order to exploit effectively opportunities provided by information and communication technologies, such fields as computer psychology, computer didactics and computer ethics should be better developed, explored and employed by educators. It is worth keeping in mind that despite the variety of information sources and teaching technologies transforming information into knowledge, there is only one way to convert knowledge into education. This conversion takes place in human consciousness. It is the most interesting and mysterious interaction between the psychic space and cyberspace. A human personality emerges and develops as a result of this interaction. It allows us to contend that no two educations evolving as a result of this interaction can be treated as completely congruous, inasmuch as no two human personalities are the same because each individual is unique. Establishing human personality as a priority was the main accomplishment of the past century. Maintaining human personality as a priority is the main imperative of the 21st century.

### ***Towards Knowledge Society***

It should be emphasized that the development and transformation of the information society into the knowledge society can be accomplished only on the basis of fundamental, scientific knowledge that, in its turn, requires a 'fundamentalization' of



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education content based on fundamental natural, social and human laws; reflecting scientifically grounded trends in their development and interdependence; shaping human ability to use these objective laws effectively for the benefit of society and nature. I would compare the future content of education with 'Ariadne's clew' that may lead an individual out of the labyrinth of daily demands and pressures.

The main reasons which stipulate the necessity of fundamentalization of education content, in my opinion, can be divided into two groups. The first group of issues refers to the global problems in the evolution of human civilization.

It may be relevant to consider the fact that in the process of their development, individuals, societies, the world community, and civilization as a whole reveal their essential or fundamental characteristics. In this context, it is important to set up on the basis of scientific picture of the world, an educational system, which could be able to identify and transfer to students the most recent scientific developments. Moreover, students' attention should be drawn to the most essential – fundamental, stable and lasting knowledge that lies at the core of the currently available scientific picture of the world. This includes the world of outer space, the world of a human being and society, and the world of human civilization as well as fundamental global processes unfolding therein.

There is, however, another group of reasons pointing to the need of fundamentalizing education content. It is derived from an understanding, increasingly shared by the world community, that an educated personality has the top priority in the knowledge society. In line with modern thinking, to nurture a broadly educated personality a number of interconnected problems should be solved. Firstly, it is crucial to harmonize an individual's relations with nature by helping him/her obtain a scientific picture of the world. Secondly, it is important not to lose sight of the social nature of a human being, and therefore harmonious socialization should be accompanied by cultural assimilation through the study of history, literature, art, law, philosophy, and economics. Thirdly, modern people live in a highly saturated informational environment. So, the task faced by the educational system is to teach students how 'to navigate' through this environment. And, last but not least, it is necessary that an individual should achieve a kind of inner balance, or harmony. Thus, the task of both solving the global problems of humankind and meeting the vital needs of an individual, points to the idea of fundamental education content.

The following question would seem to be relevant: What lies at the basis of fundamental education content? Apparently, the emphasis is on fundamental sciences. However, before we get to the issue of fundamental education content, it appears necessary first to develop a holistic perspective on fundamental sciences per se. The fragmentation and differentiation of sciences in the 20th century have reached a point where specialists working in different areas of what used to be a unified field of science no longer understand one another. So, the task of scientists and educationalists is to identify the sum total of each fundamental science, then try to reveal the internal unity of natural sciences as a whole and the entire body of human sciences and, finally, at the next stage, to synthesize the principles of holistic fundamental education content.

It is worth mentioning that scientific knowledge cannot be automatically assimilated by students. Nor can it be simply passed on by the teacher to an inactive student, for it is generated by the student himself or herself as a result of his/her inner creative activity. It is a product of evolution and self-organization of human intelligence. The teacher's role is to awaken the student's intellect, to shape an individual's creative potential and holistic world outlook, to show him or her models of holistic thinking.

Thus, the educational paradigm for knowledge societies can be defined as a logically connected triad 'From holistic world to holistic knowledge, and via it to a holistic personality'.

The large scope of the processes of building knowledge societies, a growing role of scientific knowledge, fundamental education and information in shaping the present and future image of humankind prompt us to search for analogies in the previous centuries.

As Ecclesiastes said:

'Is there any thing  
whereof it may be said,  
See, this is new?  
it hath been already of old time,  
which was before us.'



Looking back and assessing the achievements of the past centuries, I shall venture to single out one very important thing: the concept of relativity formulated by Albert Einstein, Sigmund Freud and Karl Marx for — respectively — physical, mental and social domains. Brilliant insights of these scholars gave humankind the possibility to realize that the world is not what it appears to be, that we cannot trust our empirical perception of space and time, of good and evil, of law and justice, and of the nature of people's social behavior. They made people realize that natural laws and intellectual concepts reflect not only the objective reality of the physical world, but the realities of the social world as well. Unfortunately, the past century has given us many examples of how these fundamental truths can be overlooked, which caused severe damage to nature, the world of living things and humankind per se.

All of the above confirms that humankind is still at the very beginning of a long and difficult road towards the knowledge society, and only by pulling together intellectual, technological and economic resources can we reach the end of this road.

### ***ICTs and Quality of Education***

It goes without saying that emergence and successful development of the evolving societies is not possible without improving quality of education of individuals and consequently improving quality of education of a given society as a whole. In the absence of common formal definition of the term 'quality' in education I believe that it is possible to include into this definition such abilities of an individual as: keeping abreast with the modern ideas and discoveries in the areas of science and technology; acquiring skills required by the latest technologies and the market; developing his or her resourcefulness through self-education. So, scientific knowledge and professionalism as products of quality education should provide a successful participation of an individual in the development of the evolving societies.

In my view, necessary and sufficient conditions can be identified in the process of improving education quality that allows meeting this important final objective of education. The necessary conditions would include such educational components as well equipped class rooms and lecture halls, highly professional administrators in managing positions at the educational institutions, highly qualified teaching personnel, easy access for students and teachers to quality textbooks and professional literature, as well as to modern teaching aids and supplementary information.

The sufficient conditions are related to a person's ability to transform knowledge and skills received into education, i.e. into customized system of ethical, cultural and professional values, and also to the ability to apply this system in various areas of intellectual and practical activity. The quality of education in my view is defined precisely by a person's ability to meet the demands of contemporary society.

The unique role played by information and communication technologies in improving education quality is based on their ability to effectively facilitate the fulfilment of both necessary and sufficient conditions for receiving quality education.

Modern level of ICT development significantly broadens opportunities available to students and teachers for gaining access to educational and professional information; improves operational ability and management effectiveness at specific educational facilities and the educational system in general; facilitates integration of national information educational systems into the world network; considerably assists in accessing international information resources in the areas of education, science and culture.

At the same time it is worth mentioning that the present level of development of information and communication technologies permits their successful application in education to release the creative potential of student owing to more efficient organization of students' cognitive activities through the use of computers with their very important didactic characteristic of individualizing the classroom work without disrupting its entirety, via programmed and adaptable curricula.

New information and communication technologies brought about dramatic changes in the educational technologies of obtaining knowledge, converting knowledge into education and applying education in practice. Moreover, when we speak about the role played by information and communication technologies in education, we should proceed from the understanding that these technologies not only facilitate educational opportunities but assist an individual in perfecting his/her perceptions, too. Modern information and communication technologies provide learners with richer information objects such as images, videos, complex structures of knowledge and their combinations, available via the Internet or other intelligent computer networks. Information and communication technologies radically extend possibilities for visualization, including



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visualization of the invisible, visualization in changed colours and shapes. Colourful images of architecture, sculpture or painting, grouped thematically and accompanied by well-written texts and beautiful music have a strong emotional effect on the student, develop his or her artistic taste and at the same time enable the student to learn more about culture, art and nature.

It is worth mentioning the words said by O. Wilde: 'For the good we get from art is not what we learn from it; it is what we become through it'.

At the same time we should take into account that parallel to education as a means of preparing students to life, cyberspace, as another educational milieu, is developing. The seminal works of Vygotsky, Piaget and Bruner gave rise to the term interiorisation of physical objects, which suggests our creating 'psychic' equivalents of the latter as 'conceptual' models to be further used to construct variants of our own internal reality or virtual realities. Cyberspace prompts a reverse process, which could be called exteriorisation: models of the physical world constructed in the human mind are let out into cyberspace. So, we should proceed from the understanding that it is necessary to develop in an individual a particular perception of his or her habitat, which comprises both: objects of the physical world and the ideas of these objects in the human mind, as well as the system of ideas in information space. Thus, information and communication technologies do not merely enhance intellect; they designate new dimensions of the human mind, produce an orderly system of a new global culture and open up vast and exciting perspectives of their use in improving quality of education.

It should also be stated that if the first approach to human interaction with the environment arose through many centuries of our species' evolution, the second approach has introduced amazing changes into human consciousness in a brief period of just a few decades. We can only guess what the nature of these changes is, what is the scope of their impact and future implications. So, I can only hope to be right in suggesting that one of the most complicated problems that have to be solved in the evolving societies is the problem of a human being in the changing world. Today, a human being has become the main factor in development of civilization as well as its main risk factor. Which of the two will prevail depends largely, if not decisively, on education and educational institutions.

## ***Learning without Frontiers***

The present level of ICT development offers a real opportunity for creating an educational milieu without frontiers. I find it is necessary to note that, in my view, there are two main obstacles that a human being should overcome in order to create an educational environment without boundaries: geographical distances and varying capacity of different people to transmit and perceive the same information, particularly of people with special needs, who, owing to various reasons, are unable to obtain education through standard methods. Due to rapidly developing global system of distance learning, new information technologies, regardless of the physical distance ensure the kind of direct and interactive communication between the teacher and the student that has always been the main characteristic and undeniable advantage of full-time education. There is no doubt that in the near future, the development of information and communication technologies will result in a broad dissemination of digital libraries, laboratories with remote access, open virtual universities and global virtual campuses as the basis for a universal educational and scientific environment serving the world community. New information technologies as well as the man-made intellectual environment have the capacity to give back, at least in part, to many people the kind of abilities and communication possibilities that they may have been deprived of by nature, environmental disasters, military conflicts, or human violence. I am confident that this is a two-way road since, after the barriers of interhuman communication are demolished, the so called 'ordinary people' will be able to obtain a broader understanding of the nature of a human being and the surrounding world. Probably, this is the major humane tendency connected with the use of information and communication technologies in education and other spheres of practical and intellectual human activities.

## ***Ethical, Psychological and Legal Issues***

The penetration of information and communication technologies into educational settings requires in principle, the formulation of new ethical, psychological, legal and moral aspects of applying such technologies to learning. New information and communication technologies offer wonderful opportunities to reach out to our fellow human beings, but the darker side of human nature finds its way into cyberspace, too. The full spectrum of reprehensible or outright debased moral behaviour is represented online: aggression, violence, crime, deception, brutality, rudeness and so on. The global nature of new information and communication technologies not only opens up broad opportunities for dissemination of knowledge, but also increases the danger of conflict between values and standards espoused by different cultures. For such a global information community



to become a reality, an effective mechanism of information exchange should be developed to inhibit the erosion of national and cultural identity. The past century has clearly demonstrated that in the great history of times and peoples, no culture or nation is small — only together they constitute the supreme value of the world civilization and the basis for the sustainable development of the world community.

### ***UNESCO's Mission***

In the new millennium, information and communication technologies will provide tremendous opportunities to narrow the socio-economic development gaps between communities and nations. They serve as an opportunity for the increased exchange of knowledge and know-how, for the promotion of intercultural dialogue, and for greater understanding among nations. Information and communication technologies give all nations a new chance that should not be missed. However, for these purposes, the key problems of the digital divide that exclude entire groups and countries from the potential benefits of digital opportunities in networked-knowledge societies and lead to a global gap between information 'haves' and 'have-nots' should be addressed urgently. Main UNESCO's programme document, namely, Medium-Term Strategy 2002-2007 stresses that bridging the digital divide between developing and developed countries and within countries thus becomes a prime strategic challenge throughout UNESCO's activities. This entails activities aimed at strengthening national capacities and professional skills of individuals, creating a new content of education, broadening access to information, fostering scientific research and sharing scientific knowledge and information through networking and the communication media and information systems. It is UNESCO's mission to promote the free flow of information, knowledge and data, to encourage the creation of diversified education contents and to facilitate equitable access to information and the means of sharing scientific knowledge while at the same time giving attention to institutional capacity-building. The Organization seeks to encourage international debate and reflection regarding the impact of globalization on access to information services and communication processes. UNESCO strives to foster the application of information and communication technologies in education at all levels, to reinforce national potential in ICT application for the development of education, to contribute to peace and human development in the globalization era through education, the sciences, culture and communication. As Koichiro Matsuura, UNESCO Director-General, noted that 'The field we have yet to explore is a broad one, and there will no doubt be a long way to go, as there is for any standard-setting action, before we arrive, in each of the areas so requiring, at instruments meeting with the approval of all. I am thinking in particular of the promotion and use of multilingualism and universal access to cyberspace, where the debate revealed that we had still to amplify our reflection and needed to engage in further consultation.' At present there are all the reasons to hope, that the endeavours of UNESCO in conjunction with political guidelines of UNESCO Member States and on the basis of international cooperation will be able to forward creating of necessary conditions for sustainable development of the evolving societies.



## CORNU, Bernard

Director, La Villa Media – the European Residence for Educational Multimedia  
(2001 – Present)

Vice-Chairman of the IITE Governing Board (2003 – Present)

**Field:** Information and communication technologies and education, teacher training, educational policies



### Professional Career:

- 2000 – 2002: Advisor at the Ministry of Education, France
- 1990 – 2000: Director, University Institute for Teacher Education (IUFM), Grenoble, France
- 1991 – 1994: President of the Conference of IUFM Directors
- 1988 – 1990: Head of MAFPEN (in-service training of education personnel), Academy of Grenoble, France
- 1984 – 1986: President of the Assembly of the Research Institute on Mathematics Education (IREM), Grenoble, France
- 1982 – 1986: Director, Research Institute on Mathematics Education (IREM), Grenoble, France
- 1969 – 1999: Assistant then Lecturer, University Joseph Fourier, Grenoble, France

### Educational Background:

- 1983: Doctoral degree (Mathematics, Informatics), University Joseph Fourier, France
- 1970: Masters' degree (Mathematics), University Joseph Fourier, France
- 1968: Undergraduate degree (Mathematics), University Joseph Fourier, France

**Born:** 1948

## PREAMBLE TO THE ROUND TABLE DISCUSSION

Information and Communication Technologies (ICTs) have brought profound changes in society and education. They are so huge that new concepts of the society appeared: information society, communication society and knowledge society. The changes are not only technological: they address the fundamental values and concepts of societies and raise new essential questions. The aim of the Round Table is to consider these questions and try to formulate some core principles and concrete recommendations for Education in Knowledge Society.

This must be done taking into account the reflections already led at the international level, particularly, by UNESCO. Speaking about the society we need to state and agree on core values, the values of humanism, peace, equal dignity of human beings, the values of solidarity – these values our countries share and want to promote. We could take as a basis for our deliberation some main principles and documents.

### *Education for All: Access and Quality*

First, the affirmation of “Education for All” is to be studied. UNESCO and its Member States committed themselves to the promotion and development of “Education for All”, considering that education is a major need for humanity, a major investment to prepare the future of humanity, that all human beings have the right to receive education, and that all countries have the duty to provide education for all. Of course, a strong and efficient international cooperation is needed in this respect. “Education for All” includes two main aspects: access (make education accessible for all) and quality (provide a quality education for all). Access and quality must be aimed at simultaneously; it would be a mistake to decrease quality in order to improve access.



## **“Four Pillars”**

There may be difficult debates about what education is. Is it just the transfer of certain knowledge? Is it more linked to the development of human beings? We can take as a basis the Report to UNESCO by the International Commission on Education for the Twenty-first Century, chaired by Jacques Delors (“Learning, the Treasure within”, UNESCO, 1996). It describes the “four pillars” of education: *“If it is to succeed in its tasks, education must be organised around four fundamental types of learning which, through a person’s life, will in a way be the pillars of knowledge: learning to know, that is acquiring the instruments of understanding; learning to do, so as to be able to act creatively on one’s environment; learning to live together, so as to participate and cooperate with other people in all human activities; and learning to be, an essential progression which proceeds from the previous three. Of course, these four paths of knowledge all form a whole, because there are many points of contact, intersection and exchange among them”*.

## **The Dakar Framework for Action**

The “Dakar Framework for Action”, adopted during the World Education Forum, in Dakar, Senegal, April 2000 stated some principles in order to enhance “Education for All”: *“...we hereby collectively commit ourselves to the attainment of the following goals: [...] ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete free and compulsory primary education of good quality.”*

And the framework gives some hints for strategies, taking into account ICTs :

*“Harness new information and communication technologies to help achieve Education For All goals:*

- *ICT must be harnessed to support EFA goals at an affordable cost. These technologies have great potential for knowledge dissemination, effective learning and the development of more efficient education services. This potential will not be realised unless the new technologies serve rather than drive the implementation of education strategies. To be effective, especially in developing countries, ICTs should be combined with more traditional technologies such as books and radios, and be more extensively applied to the training of teachers.*
- *The swiftness of ICT developments, their increasing spread and availability, the nature of their content and their declining prices are having major implications for learning. They may tend to increase disparities, weaken social bonds and threaten cultural cohesion. Governments will therefore need to establish clearer policies in regard to science and technology, and undertake critical assessments of ICT experiences and options. These should include their resource implications in relation to the provision of basic education, emphasising choices that bridge the ‘digital divide’, increase access and quality, and reduce inequity.*
- *There is a need to tap the potential of ICT to enhance data collection and analysis, and to strengthen management systems, from central ministries through sub-national levels to school; to improve access to education by remote and disadvantaged communities; to support initial and continuing professional development of teachers; and to provide opportunities to communicate across classrooms and cultures.*
- *News media should also be engaged to create and strengthen partnerships with education systems, through the promotion of local newspapers, informed coverage of education issues and continuing education programmes via public service broadcasting.”*

## **IFIP Montreal Youth Declaration and Vilnius Declaration**

More recently, two major texts provided key principles and stated recommendations:

- The participants in IFIP World Computer Congress, Montreal, Canada, 2002 adopted “Youth Declaration”. It highlights the importance to sensitize authorities and the society about the necessity to include the development of ICT infrastructures and ICT skills for young people as a high priority in policies and agendas. It affirms the commitment to ensure a youth-oriented digital inclusion. A set of concrete recommendations is then provided.
- The participants in First World Information Technology Forum (WITFOR), in Vilnius, Lithuania, 2003 adopted “Vilnius Declaration” inviting national governments to give priorities to national socio-economic development plans to create ICT infrastructures, urging national governments to guarantee the application of the principles of freedom of expression and privacy, ensuring a continuous process of education on the rights of citizens as a fundamental element of poverty alleviation, facilitating knowledge and information sharing, encouraging international cooperation, empowering all communities through programmes aimed at developing literacy, including ICT literacy, etc.



# Towards Knowledge Societies

Geneva, Switzerland

10-12 December 2003

## **World Summit on the Information Society**

Ministerial Round Table on “Towards Knowledge Societies”, Paris, October 2003 adopted a communiqué, reminding of some fundamental principles for the development of equitable knowledge societies: freedom of expression; universal access to information and knowledge; respect for human dignity and cultural and linguistic diversity; quality education for all; investment in science and technology; understanding and inclusion of indigenous knowledge systems. This communiqué must be considered an essential input to the work of the World Summit on the Information Society (WSIS).

Finally, two documents gather a set of principles and recommendations, to be addressed during WSIS: “Draft Declaration of Principles”, and “Draft Plan of Action”. The declaration of principles recognizes, that education, knowledge, information and communication are at the core of human progress, endeavour and well-being. A vision of Information Society for all is presented, and access to knowledge is quoted as a key principle. The plan of action gives concrete recommendations: several address access to knowledge and capacity building: *“Everyone should have the necessary skills to benefit fully from the Information Society. ICTs can contribute to achieving universal education worldwide, through delivery of education and training of teachers, and offering improved conditions for lifelong learning, encompassing people that are outside the formal education process, and improving professional skills.”* The plan recommends to *“develop national policies to ensure that ICTs are fully integrated in education at all levels, including in curriculum development, teacher training, institutional administration and management, and in support of the concept of lifelong learning.”*

## **From Information Society to Knowledge Society**

Some years ago, we were talking about computers and informatics, and their influence on learning, teaching, and education. The new technological tools brought new resources for the teacher, and were considered a supplementary aid for teaching, like other technologies had been before. Information technologies then developed processing digitalized information. At the same time, communication technologies transporting digitalized information, developed as well; both merged leading to new tools known as information and communication technologies. The concept of Information Society appeared: information has become a valuable good, that one can buy and sell, and information has acquired a major place in economic and social matters. The organization of societies evolves being based more and more on information and access to information. Information is very easily accessible, in any place, at any time. But new questions appeared: how to sort and categorize information, which is abundant and untidy? How to evaluate and assess information, how to distinguish between accurate and wrong information? New ethical questions about information, access to information, and distribution of information were raised. Information is like raw materials: it must be processed before used.

Information is not knowledge. Information, even if it is digitalized, interactive, dynamic, has no human dimension. The next step, the major step, is now to move toward Knowledge Society. Information Society is based on technology; Knowledge Society is based on human beings.

Knowledge is a good that can be stored, circulated, exchanged. But it is an evolving good, continuously changing and enriching. Knowledge has a human dimension; it is linked with what human beings do and think; knowledge is created and developed in and by human beings. Knowledge is both an individual and collective matter. Knowledge is linked to culture and technology; there exists not one knowledge society, but, certainly, many knowledge societies. Some have a lot of knowledge and can produce knowledge; others are poorer; there are conflicts about knowledge, territories, and borders. In knowledge societies, our geographical and political borders are no longer accurate, new borders are appearing, as well as new territories, new powers, and new conflicts.

Knowledge societies must not be reduced to knowledge economy: it is not only a matter of buying and selling knowledge, but, more fundamentally, to analyse the social changes due to the advent of knowledge societies.

We are used to describe knowledge in terms of subjects, disciplines: mathematics, history, literature, languages, etc. But knowledge is getting more and more composite; the questions addressed in society, that knowledge must keep answering, are more and more transverse and complex. Edgar Morin has shown that the necessary knowledge cannot be listed in the terms of disciplines, and he has suggested “Seven complex lessons in education for the future”: detecting error and illusion, principles of pertinent knowledge, teaching the human condition, earth identity, confronting uncertainties, understanding each other, and ethics for the human genre.



## ***Knowledge and Education***

So, new challenges are raised for Education in the knowledge societies: transforming information into knowledge, identifying accurate knowledge, transmitting knowledge ...

Accessing knowledge takes new forms. Knowledge is no longer accessible only in books and in the teacher's head! Knowledge is now available in many different places, and attainable from any place, at any time. Education has a new role in terms of making knowledge accessible for pupils, and guiding pupils in getting knowledge. However, it is not enough to access knowledge; knowledge must be actually acquired. Since there are profound changes in the knowledge, there are changes in learning and acquiring knowledge. These changes we must try to identify.

There is, of course, a strong link between knowledge and education. Education is the main process dealing with knowledge. So, in a knowledge society, education takes a central role and is a major stake for future and evolutions. Education takes the characteristics of an economical activity in such a society. But it is a political and social responsibility of decision-makers to ensure that everyone can access and acquire knowledge. The question of education as a public service is raised in a new form, in a context where knowledge is a good and education — an economic activity.

## ***Education for and in Knowledge Societies***

At the Round Table, we will address two main aspects of education and knowledge societies: education FOR knowledge societies, and education IN knowledge societies.

Education for knowledge societies, because knowledge societies expand progressively, and we must educate pupils and students for this kind of society: preparing the knowledge societies, preparing citizens of knowledge societies, preparing people to understand knowledge societies and to act and behave in such societies. Education must take into account the main trends in the changes toward knowledge societies, identify the main challenges to overcome; educational policies must be designed in the context and framework of knowledge societies. Education and educational policies must follow the changes and evolutions, as well as anticipate and, therefore, help decision-makers and the civil society impact the evolutions to master them.

Education in knowledge societies, because in such societies, knowledge has changed, access to knowledge is different; learning in knowledge societies, and teaching in knowledge societies, include new components, new concepts, new pedagogical approaches, and need new resources and new tools.

## ***Networks***

Knowledge societies are networked societies. We are used to hierarchical structures, to pyramidal or tree-type organizations. Knowledge societies are structured by networks. A network is very different from a pyramid or a tree: there are edges and nodes, the edges linking the nodes; from one node to another one, there are several possible paths. There may be lots of sub-networks. There is no natural hierarchy, but new types of hierarchies may appear. The Internet is the clearest example of such a network. One can circulate in a network, but this needs to be mastered, tools and rules are necessary. Accessing information is, mainly, made through networks now. The network structure of such societies will, certainly, have huge consequences on the organizations. A school, an educational system, cannot stay organized as hierarchical and pyramidal structures in a society where knowledge and people are networked. This can lead to profound and unexpected changes in our societies.

## ***Competencies***

Knowledge societies need new types of competencies. We have already mentioned that the educational needs of societies can be considered through the four “pillars” of education: learning to know, learning to do, learning to live together, learning to be. In knowledge societies, knowledge is not static, it evolves and it is permanently enriching. Education cannot be reduced to the transmission or acquisition of a set of definite knowledge; it would be soon obsolete. Learning to learn is a necessary ability that education must provide. It is the content as well as the processes that education must transmit. The ability to evolve, to adapt, is essential in knowledge societies; education must take it into account. Knowledge societies are lifelong learning societies, and education must prepare to lifelong learning.



## ***Collective intelligence***

Knowledge societies need virtual communities and collective intelligence. We were used to educational systems aimed at acquisition of individual knowledge and development of individual intelligence. But more and more, society needs collective kinds of competencies. In knowledge societies, knowledge and processes are mainly collective. This requires collaborative work, teams and communities. The concepts of virtual communities and collective intelligence are essential in knowledge societies. Virtual communities are communities of real human beings made possible and activated through information and communication technology tools; ICTs implement new kinds of communities, enable to overcome usual barriers and borders, create new communities who can communicate, work together, act together. Collective intelligence is not a mere sum of individual ones: there is an “added value”, a kind of intelligence, which is communal, which no one could have alone.

## ***School in Knowledge Societies***

When we speak about knowledge societies, we mean that we do not want to reduce them to technology societies or information societies. The role of schools and education is essential in knowledge societies. Of course, education must focus mainly on knowledge, not on technology. Every educational policy must address knowledge, not only technology and communication. The role of school in knowledge societies raises new questions: schools for the knowledge society, schools in the knowledge society. However, information and communication technologies change the status, mission, role, and action field of schools. What will education be, and what will the school be in future, in knowledge societies? OECD has published a very interesting study about the school of the future, imagining six different scenarios. Such scenarios are not the guessing what the future will be, it makes us aware that there is no fatality in the future: we must decide where we want to go and act within the appropriate parameters in order to master our future, the future of schools. The scenarios are of three types:

1. Attempting to maintain the status quo:
  - Bureaucratic school systems continue.
  - Teacher exodus; the “meltdown” scenario.
2. Re-schooling:
  - Schools as core social centers.
  - Schools as focused learning organizations.
3. De-schooling:
  - Learning networks and the network society.
  - Extending the market model.

Such scenarios can help policy-makers and decision-makers design appropriate policies for the future. They can help anticipate, not only follow!

The question of anticipation is a crucial one. Technology evolves very quickly, and changes are so fast that most of the time we just try to catch up with our delay, to adapt our old strategies and habits to the new tools and technologies. It is not enough, and may even be wrong. There is a need to re-think the main paradigms of education in knowledge societies. Innovation must not only follow the evolutions of technology and the evolutions of society; it must anticipate, be pro-active.

## ***Pupils and Learning in Knowledge Societies***

The pupil and the student are at the centre of education in knowledge societies. The pupil is the learner, but cannot be reduced to the one who acquires knowledge. The pupil is a citizen in the knowledge society, and the pupil must be prepared and educated as a citizen of the knowledge society. We have to reflect on this new “knowledge citizen”, so that the fundamental values of the knowledge society can be described and respected: equity in access to knowledge, solidarity, equal dignity of human beings, etc. The relationship between individuals and society has new characteristics in the knowledge society, particularly because of virtual communities, of collective intelligence. We have to invent a citizenship for knowledge societies.

Lifelong learning is an important component of Knowledge Society. Since knowledge is at the core of such a society, learning is an essential process, and it must go on all life long. Knowledge societies are lifelong learning societies.



Knowledge societies and ICT make possible and need new learning methods. ICT enables to take into account space and time in education differently; we are not bound to the “same place – same time” aspect of school classes; it becomes possible to have school activities at different times and different places. Distance education does not address only the ones who are in particular situations; it becomes a component of Education for All; we have to invent a good articulation and a good balance between class and distance education activities, in order to improve education and learning.

### ***Teachers in Knowledge Societies***

Being a teacher in the knowledge society is a new challenge. Of course, there are new teaching methods, new pedagogies, new tools, and new resources available for a teacher. However, the role of a teacher is changing, and the expectations of society toward teachers are evolving and increasing. The role of a teacher in the learning process is essential. Whatever the technology can do, the teacher remains the only one able to be the necessary human mediator between the pupil and the knowledge. The teaching profession is evolving, because access to knowledge is changing; the teaching profession is evolving in its everyday activities, in the way teachers work with others. Although the core role of a teacher remains, being the one who makes the pupil acquire knowledge, and preparing future citizens.

The role of a teacher is essential; in societies changing quickly toward knowledge societies, the teacher is the main actor, the main agent of the evolution of education. Teacher education is, therefore, fundamental, and a key issue in every educational policy. In the projects, action plans, reforms of education, teacher training is a central issue. It is clear that in order to help countries overcome the digital divide teachers' education is one of the most important tools. Teachers' education has become a major stake in national policies and at the international, worldwide level.

In 1966, the UNESCO Special Intergovernmental Conference on the status of Teachers adopted “Recommendation Concerning the Status of Teachers”. This set of precise and concrete recommendations for action is still very vital, and most of them have not been completed yet. It would be useful to check these recommendations and evaluate to which extent they have been put in action, and to update them, taking into account the new kind of society we live in, and the integration of information and communication technologies. Recommendations concerning the status of teachers in the knowledge society are very useful nowadays!

### ***Need of Policies***

So, our Round Table has a lot of questions to address. Our main issue is Knowledge Society: what is it, what are the new trends in such societies; what are the place and the role of education in knowledge societies, how central education is realized in such societies. Education for knowledge societies and education in knowledge societies will be our main topics. We will see that there is a need of strong and concrete policies in order to develop education for and in knowledge societies. It is not a matter of unavoidable evolutions; political choices and decisions must make us master the evolutions and the future. Principles and recommendations for educational policies in knowledge societies will be the main outputs of our Round Table.

We are in the context of globalization. This may have negative aspects, possible risks, and this leads to essential ethical questions about the digital divide, our local cultures, risk of merchandization of knowledge and education. But let us look at it from the positive side: an opportunity to develop a real international dimension in education, a real cooperation between our countries. The knowledge society does not have the same borders our geographical and political countries have; let us take this as a new chance to reinforce international cooperation in a way that respects and enhances cultures and identities.

Knowledge societies need education, and education has a much more important role in such societies. Let us use the opportunity of the knowledge societies to promote and enhance Education for All, give access to education for everyone in the world, in particular, to quality education for everyone.






# **Towards Knowledge Societies**

Geneva, Switzerland  
10-12 December 2003

## **SESSION I**

**Education for Knowledge Societies:  
Trends, Challenges and Policies**



**CORNU, Bernard**

## **PREAMBLE TO SESSION I. EDUCATION FOR KNOWLEDGE SOCIETIES: TRENDS, CHALLENGES AND POLICIES**

At the first session, we will discuss the present and future evolutions of our societies. We are moving to information society, communication society, and knowledge society. What is the place of knowledge in our societies, what are the economic and social stakes of knowledge? Which kind of society do we wish and aim at? Since knowledge appears to be central, education is a major issue for and in society. We will address the main trends in the evolutions, and discuss how we can master the evolution according to some main principles.

Information and communication technologies abolish some of our borders, but certainly create new frontiers, that we have to identify. The knowledge societies lead to new dimensions and new networks at the national and international levels. We will try to identify them during this session.

Education for all is a major challenge in our world: access to education for all, quality education for all. We must ensure that Knowledge Society is a society for all, where everyone can find his/her place, a society, which respects human values and human rights. We will discuss the principles and conditions for a Knowledge Society for All.

Before addressing the questions of education in knowledge societies at the next session, we must first consider the question of preparing knowledge societies: education for knowledge societies. How education, through its contents and methods, can help preparing a knowledge society? Which challenges are to be met?

The political dimension is crucial: preparing knowledge societies is not a matter of technology; it is mainly a political question, which must be addressed through policies. We will discuss how policies can be designed in order to shape knowledge societies respecting our universal values, and how educational policies can integrate information and communication technologies in order to enhance and develop the place and role of education in our societies.

The speakers will consider a set of important questions about knowledge societies and the way education can help in the development of knowledge societies:

What are knowledge societies? How to move from information to knowledge?

Which principles and recommendations should we formulate for decision-makers and policy-makers?

How can we prepare citizens of knowledge societies?

Which kind of education is needed for knowledge societies?

How to promote Education for All in knowledge societies? What are the international dimensions of Education for All in knowledge societies?

Which kind of knowledge society corresponds to the values promoted by UNESCO, and how education can prepare such knowledge societies?

The question of teachers and teachers' education plays a major role in knowledge societies. We will discuss the new role of teachers and the importance of their education.

Which learning methods are appropriate for knowledge societies?

Ethical questions in a knowledge society will also be addressed: globalization, merchandization of knowledge, digital divide and new kinds of divides in knowledge societies. Digital divide is not only a matter of technology; the challenge is to ensure that there will be no divide in accessing and sharing the knowledge.





Are knowledge societies contributing to the progress of humanity?

How information and communication technologies can help education in knowledge societies?

What are the role and place of information and communication technologies in knowledge societies?

How to enhance capacity building in knowledge societies?

Sustainability takes new dimensions in knowledge societies; how can we address the question of sustainable knowledge and sustainable education?

The speakers have been invited to consider the principles in WSIS draft declaration of principles, and action items in WSIS Draft Plan of Action and to enrich, complete and specify them through their suggestions.

A final discussion should then lead to a short list of strong principles and recommendations from Session I.

# Towards Knowledge Societies

Geneva, Switzerland

10-12 December 2003

## ADAMKUS, Valdas

**UNESCO Goodwill Ambassador for the Construction of Knowledge Societies**  
**Former President of the Republic of Lithuania**

**Field:** Environment protection, ICTs and policy-making

### Professional Career:

- 1998 – 2003: President of the Republic of Lithuania
- 1983: Chairman of the Organizing Committee of the World Lithuanian Games
- 1972 – 1997: Administrator at the U.S. Environment Protection Agency (EPA)
- 1970 – 1972: Deputy Administrator at the U.S. Environment Protection Agency (EPA) Region 5 (Great Lakes Region)
- 1967: Chairman of the SANTARA-SVIESA (Accord-Light), Association of Lithuanian students in the USA
- 1961 – 1964: Member of the Board of the American-Lithuanian Community (LC), Vice-Chairman of the Board, member of the American-Lithuanian Council (ALC)
- 1958 – 1965: Vice-Chairman of the SANTARA-SVIESA (Accord-Light)
- 1957 – 1958: Chair of the Board of the Santara (Accord)
- 1949 – 1996: Secretary General and Chairman of the Physical Education and Sports Committee
- 1946 – 1948: World YMCA organization

### Educational Background:

- 1960: Master's degree (Engineering), Illinois Institute of Technology, USA
- Undergraduate degree (Natural Science), Munich University

**Born:** 1926



## EDUCATION AND KNOWLEDGE SOCIETIES

Education and knowledge societies are linked with each other on a fundamental basis. Knowledge societies may be neither built nor developed without education. Education is a keystone of building the knowledge society as well as of its existence.

Developed knowledge societies first of all mean a quality education accessible to everyone. They build on well-educated people, able to use their knowledge independently. Also knowledge societies focus on lifelong learning that makes the knowledge society work. In the era of rapid changes, where up-to-date information so quickly becomes out-of-date information, it is impossible to learn things "once and forever". Only continuous learning makes us feel safe in the fast changing world of information. Hence, it follows that the knowledge society is a learning society by definition.

The Lisbon European Council's conclusion that "the move towards lifelong learning must accompany a successful transition to a knowledge-based economy and society" is applicable to all countries, which have chosen to build a knowledge society.

Transition towards the knowledge societies is inseparable from the essential education reforms. Therefore, continuous learning and lifelong learning should become a paradigm of renewed education.

What are these particular changes that would help people to establish themselves and then successfully integrate into the knowledge societies? In many countries this question is a matter of theoretical discussions as well as an issue of practical implementation of the education policy. The actions taken toward building the knowledge society are two-folded.



On the one hand, practical actions can be oriented toward education reform and modernization of the education system marked by transition from closed educational of industrial society, to open and flexible forms of education of information society. The existing forms of formal, non-formal or informal learning are gradually merging into integral space of overall education.

Such open education space would provide best conditions for people to choose desirable forms, timing and location for studying. Distance learning and diverse forms of training at work would gain momentum in this case. Formation and development of modern business enterprises acknowledging the value of continuous learning is not of the least importance either. Transition to credit-based and “accumulative” learning depends on the establishment of a flexible system of evaluation of knowledge, skills and qualifications and acknowledgement of the results. An adequate fiscal policy designed to stimulate both corporate and private investment into lifelong learning, should accompany the modernization of the education system.

On the other hand, in order to meet the demands of the knowledge society, the content and methods of teaching must be essentially renewed. The knowledge society requires adequate cultural and social competence of a person as well as new skills and abilities. Speaking of skills: skills to learn continuously, ability to find, choose and make critical assessments of information, analyze and to use information to accrue personal and public benefit. The age of information poses a great danger both for an individual and a society threatening to undermine their independence and identity, if they are not culturally consolidated and have not developed adequate skills.

The knowledge society changes the role of a teacher and a school dramatically. Today it is not enough for teachers to be just knowledge transmitters – they shall assume new roles: those of moderators, learning partners, mediators between students and the information environment.

These are just very rough and general guidelines for education reforms. However, in the meantime we have more questions than answers related to the modernization of education and its adaptation to the needs of the knowledge societies. It is therefore critical to learn from the best experiences and to exchange information with other countries. And furthermore, neither modern education reform nor successful building of knowledge societies is possible without close cooperation among governments, NGOs, business and public communities, without joint discussions, joint decisions and joint actions.

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## WEI, Yu

**Director of Research Center of Learning Sciences, Southeast University, Nanjing, China (2002 – Present)**

**Vice President of China Association for Science and Technology (2003 – Present)**

**Vice President of All China Women's Federation (1988 – 2003)**

**Academician of Chinese Academy of Engineering**

**Field:** EE, Biomedical Engineering, Learning Science



### **Professional Career:**

1993 – 2002: Vice-Minister of Education, China

1986 – 1993: President of Southeast University, Nanjing, China

1966 – 1993: Assistant Lecturer, Association Professor, Professor and Dean of BME, Southeast University, Nanjing, China

### **Educational Background:**

1981: Doctoral degree (Electrical Engineering), TH Aachen, Germany

1965: Master's degree (Electronics), Nanjing Institute of Technology (now Southeast University), China

1961: Undergraduate degree (Electronics), Nanjing Institute of Technology (now Southeast University), China

**Born:** 1940

## KNOWLEDGE SHARING AND INTERNATIONAL COOPERATION IN SCIENCE EDUCATION

Rapid development of science and technology as well as the globalization of economy are driving the world from the knowledge-based economy towards the knowledge-based society. This tendency poses serious challenges to education sector, that is, how to offer more people the opportunity to join this development and benefit from it. A top priority is to provide the chance to every citizen, especially our children, to leap onto the platform of the Internet or the Internet alike, and link to the information society pushed by the information waves.

China is a vast developing country with great diversities between cities and countryside. In order to narrow the digital division among areas, the Chinese Ministry of Education has set up a network infrastructure popularly known as "heaven and earth combined" IT-based distance education system covering cities and remote areas as well. Using this infrastructure, two projects "The Project of Training Female Teachers for Tomorrow" and "The Project of Modern Distance Education in Primary and Secondary Schools in Western China" have been successfully carried out in cooperation with LI Ka Shing Foundation in Hong Kong. 10,000 sites have been put into operation. Its supporting system, including universities, local authorities and institutes of distance education, has been developed. In the next five years, the Chinese government has planned to popularize this infrastructure in more areas. It is proven that, if we can take teachers into serious consideration and offer concrete help to them, teachers in the countryside, including women teachers, can meet the demands of IT technology and join the development of the information society.

The changes of education in the knowledge-based society indicate not only the building of new hardware infrastructure, but the changes in the learning methods, even the living styles. A joint effort in science education, called "Hands on Inquiry-Based Learning", initiated by the international scientific society has spread from the U.S.A. to France, and now to many developing countries like China, Brazil, Malaysia, etc. This education innovation is expected not only to improve the knowledge acquisition, though it is important, but also guide our children to a better way to learn and a correct way to learn.

Building infrastructure, innovating learning philosophy and process, as well as knowledge sharing require joint efforts of governments, international organizations, NGOs and private sectors. UNESCO can take its leading and important role in accomplishing the goal of quality education for all with equality and equity.



## WEILER, Raoul

Member of the Executive Committee (International) of the Club of Rome  
President of the Brussels-EU Chapter of the Club of Rome  
Vice President of the European Academy of Sciences and Arts, Salzburg, Austria  
Professor of the University of Leuven, Faculty of Agricultural and Applied Biological Sciences,  
Center for Ethics on Agriculture, Life Sciences and Environment (1997 – Present)  
Consultant in ICT and management



**Field:** Study of and teaching on the relation between society and technology

### Professional Career:

1970 – 1996: Chemical Industry as researcher, engineering and ICT manager  
1966 – 1969: Post doctoral Fellow at the University of North Carolina at Chapel Hill, USA;  
The Catholic University of America, Washington DC, USA; Université Paris V, France

### Educational Background:

1966: Doctoral degree (Applied Biological Sciences), University of Leuven, Belgium  
1962: Master's degree (Bio-Engineering, Chemistry), University of Leuven, Belgium

**Born:** 1938

## ICT AS AN INNOVATOR FOR SUSTAINABLE DEVELOPMENT

### Introduction

The contributions of ICT to sustainable development are manifold, and all sectors of the daily life will be affected. Futurologist **Ray Kurzweil** pictures a “time line” till the end of this century in his book *The Age of the Spiritual Machines*, Viking (1999). In about twenty years a computer device of about \$1,000 will have the computational ability approximately of human brain. Computers will be largely invisible and embedded everywhere, paper books and documents will be rarely used, and most learning will be conducted through intelligent, simulated software-based teachers, etc. (page 278). Even when these forecasts have a prophetic character, nobody doubts that ICT is at the edge of revolutionizing our society profoundly, therefore, frequently designated as a paradigm shift.

Does this technology possess the potentiality to become a major innovator for sustainable development and for reaching a sustainable world society? This is, in fact, a major question in the light of this World Summit. Sustainability is an overarching issue for the mankind and cannot be put aside during the summit.

Reaching a sustainable global society implies that fundamental aspirations, expressing the desire to share a decent living of all people on earth, have to be fulfilled. This means *in concreto*: fast alleviation of extreme poverty, sufficient food supply and shelter, improved basic health care, reduction of adult as well young illiteracy, correct use of the ecological system, including its resources, by industrial societies. This world “*problématique*” has amplified with almost doubled world population during this century.

ICT has the potential to cope with these situations as well as intrinsic power to bring about “quantum jump” solutions: ICT is a part of the “*résolution*” for these global problems. Sustainable societies will be attained only when the alleviation of poverty is made convincingly apparent. Several international conferences have stated that education of people is the best way, if not the only one, to realize its eradication. ICT is a new tool for “leapfrogging” to this objective as well as it is the key to bring



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developing countries in the information and knowledge age. Information and, successively, knowledge are the instruments for local innovation and local entrepreneurship embedded in the local traditions, habits and cultures.

## ***Perspective of the Club of Rome***

From the very beginning the Club of Rome has paid considerable attention to the problem of education. As early as 1979 the report to Club of Rome *No Limits to Learning. Bridging the Human Gap* (1979, 1998) by **James W. Botkin et al.** was published.

In 1997, the United Nations University commenced its new International Leadership Academy with an ambitious program hosted by the Government of Jordan and held in Amman, on the campus of the University of Jordan. Our Honorary Member **Harlan Cleveland** held a series of lectures *Leadership and the Information Revolution*. In the lecture *The Global Fairness Revolution* he writes: "As information — abundant, shareable, and instantly accessible — now becomes the world's dominant resource, what does that mean for the prospect of fairness? Surely it means that people who get educated to convert information into knowledge and wisdom, who hone their intuitive powers, who learn to achieve access to information and (even more important) how to select what they need from the information overload, will likely be better off and more fairly treated than those that don't." (p. 30).

The activity of "education" is of all times, from the very first moments of the appearance of man on earth. In his book and report to the Club of Rome *Global Population Blow-up and After* (to be published, 2003), our colleague **Sergey Kapitza**, advances a non-linear mathematical formalism of the growth of mankind. The formalism presents a time constant to which the author gives the following interpretation: "the time constant of 45 years for the multiplication of humanity is not set by a rate of procreation, but by an information based process of educating the next generation, and that is what limits the growth rate. In other words, in the population blow-up we have hit a systemic crisis of time for bringing up, educating and training the next generation." (p. 144).

## ***Education for Knowledge Sharing and Capacity Building for Sustainable Development***

The "digital divide" is but one element of a broad gap that separates the rich from the poor. Development of appropriate ICT has the potential to narrow the gap. However, the broadening of participation in and responsible engagements with the information society must also focus on education and in a later phase on entrepreneurship. The efforts must also go far beyond simple provision of access to infrastructure, affordable terminals and services. Education and innovation are linked to the creation of knowledge and its dissemination in communities.

*Education for ICT.* People need skills and knowledge in order to handle the information flows they will be confronted with. Education for ICT is necessary to promote the use of local knowledge with new technologies. To allow the emergence of "multiple modernities", indigenous knowledge has to be fully integrated into the new social reality. Cultural and linguistic diversity is to be fostered as an element of global cohesion.

*ICT for Education.* As education is necessary in order to develop information and knowledge societies, ICT has to be used to develop education systems. It empowers society to develop new learning methods, to promote distance learning, to create virtual libraries and universities, to assist with innovation and training. In the domain of social innovations in education and health-care, ICT allows greater peer support among pupils and teachers, at the local and community level. All world universities and higher schools have to be connected in the same sort of high-speed network for research, education and collaborative development as is available in Europe and the US.

*ICT for Capacity Building.* Equity and social cohesion are prerequisites for attaining sustainable communities and societies. Capacity building is people-centred development deeply embedded in this social, economic and political environment. Capacity building has to be designed to promote change, to reduce vulnerabilities and to motivate local populations, and implies a long-term investment in people. ICT offers new possibilities to accelerate learning processes for basic education as well as for enhanced skills training in many domains.

Successful "Bridging the Digital Divide" requires a simultaneous development of infrastructure of ICT networks mostly accompanied by decentralized electrical power to be installed, and training of future teachers. Governments insist too frequently on their efforts to shape an infrastructure and overlook the problem of teachers' training and conditions for



acceptance. In the absence of a simultaneous implementation of the human, technical as well as financial investments, the risk is real that they will miss the objectives and expectations ICT can offer for further development.

### ***Resource Use and Cultural Diversity as Part of Sustainable Development***

Information systems play an essential role in reaching environmental targets for sustainable development. At WSSD in Johannesburg, the Plan of Implementation lists numerous actions on environmental preservation and climate change, which cannot be realized without the support of ICT. These technologies can enable systematic and comprehensive monitoring to protect and conserve Earth's ecosystem: the protection of forests against uncontrolled exploitation, the protection of oceans and coastal areas against large-scale pollution, and of the marine environment against land-based activities. We also need a monitoring system to mitigate the effects of desertification, drought and floods, to measure climate change, to monitor land and natural resource use, and to manage rescue efforts after large-scale disasters. There will be sustainability when resource use is in relation with its availability, this means equitable use for the present generation and the ones to come.

The accumulation of very large amounts of data about the eco-system as well as about their use in industrial production processes, their effective use and archiving for the far future requires a global structure and management facilities. The third *Conference on the Digital Earth* in Brno, 2003, Czech Republic, has taken a step in the right direction. The availability and use of data about the Earth's co-evolution with mankind will allow the modeling of future scenarios, and will provide national and world leaders with the necessary tools to make decisions.

We must develop culturally diverse, tolerant and vibrant societies in which individuals have the opportunity to pursue actively and fulfil their primary need of a sense of identity and a sense of belonging. The elaboration of an overarching vision of a world with "multiple modernities", with communities rather than ideologies in which different cultures peacefully coexist, a world of "learning communities" in which no culture imposes its values on others, and where "indigenising modernity" and "learning from each other" are values in themselves has the highest priority, especially, in the frame of this world summit.

### ***Technology Transfer and Innovation for Sustainable Development***

Many developing countries recognise the unique potential of the knowledge resources of their own people and culture. Indigenous knowledge holds great promise in providing the means of eliminating the alienation many people feel from science and technology and ICT, especially. Several original knowledge projects have already shown a rich potential for better development, as well as for new technological innovation. Technology transfer and the adoption of technologies is a human-centred process, and it has to be ensured that as many as possible people master modern technologies, especially ICT, and integrate them in their social activities, including education, delivery of services and economic activity.

Far more attention should be paid to the receptor capacity for technology transfer in the developing world. A policy for sustainable development should shift from the notion of technology transfer to a far broader concept of "technology and knowledge partnerships". Partnerships between local communities and suppliers have to be based on mutual respect and recognition and are prerequisite for any further development. Technology transfer has to be a shared process between partners, allowing the receptors to pursue, in later stages, the development with local research institutions, universities or business partners. Governments of developing countries need to invest in R&D, as well as the private sector needs to have incentives to do the same. However, in the economic structure of many developing countries this process is made more difficult when large global corporations, that earn significant revenue from developing countries, fail to do research and development in these countries. There should be an obligation for proper R&D investment tied in some meaningful way to the revenues earned by these companies, especially when the countries themselves are investing in R&D.

Sustainable development will not be achieved unless there is a redirection of the efforts to develop the full potential of people through education, which includes mastery of modern technologies. The emerging networked knowledge society has to integrate the richness of indigenous knowledge as well as to assimilate eco-centric and anthropocentric visions of a sustainable world society. ICT allows worldwide communication among populations and has the innovative potential in the coming decades to enhance a multilateral understanding. At the world level a new global ethics of human solidarity is needed.



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## **SESSION II**

**Education in Knowledge Societies:  
Strategies, Tools, Teaching  
and Learning**



## MOREL, Raymond

Director of the Geneva Educational Technology Centre (CPTIC) (1987 – Present)  
Expert for the Swiss ICT Task Force (2000 – Present)  
Member of the Scientific Advisory Board of the Swiss Academy of Engineering Sciences (SATW) (2001 – Present)  
Chairman of the SATW ICT Committee (2002 – Present)  
Special consultant of the TC-3 (Education and ICT) of the International Federation for Information Processing (IFIP) (2003 – Present)



**Field:** ICTs and education, teacher training

### Professional Career:

1975 – 1992: Chairman of the Swiss group of coordination for ICT  
1967 – 1992: Lecturer at the College of Geneva

### Educational Background:

Mathematics, Astronomy and Mathematical Statistics, University of Geneva, Switzerland

**Born:** 1944

## PREAMBLE TO THE SESSION II. EDUCATION IN KNOWLEDGE SOCIETIES: STRATEGIES, TOOLS, TEACHING AND LEARNING

The speakers at this session will address the question of Education in Knowledge Society. In such a society, education takes a specific dimension and particular forms. For instance, OECD has published a study about the school of the future, with six possible scenarios for the place and role of schools in future societies. How can UNESCO and other national and international bodies in the future promote and facilitate the development of education for and in such new type of a dynamic society.

According to the discussion of the first session and taking in account some main priorities of UNESCO for 2004–2005 (as decided two months ago, i.e. education for all, ethics in sciences and technologies, cultural diversity and access to information and to the knowledge), four speakers with their experience will present their opinions about some urgent questions such as:

- What is learning in a knowledge society? Are there specific new forms of learning?
- What means teaching in a knowledge society? What are the place and role of a teacher in a knowledge society and how to facilitate this evolution?
- How can ICTs help teaching and learning in a knowledge society?
- Which new tools and resources should be available for teaching and learning in a knowledge society?
- What should be the specificities of educational policies in the ICTs context and in a knowledge society?

The session will regard the “Youth Declaration” adopted at IFIP WCC in Montreal (2002), as well as the output of WITFOR 2003 Conference.

In this session the speakers will consider a number of specific themes coming from their fields of competence:

- From a ministerial point of view what is a national educational policy in a knowledge society and how can it contribute to new forms of teaching and learning? How to formulate core principles of educational policies in knowledge societies and to suggest possible actions?

- How can international cooperation and international organizations contribute to develop education in knowledge societies? How to promote research, development, pedagogy, cooperation, etc? How to formulate core principles of international cooperation in knowledge societies and to suggest possible actions?
- On the new forms and tools for Education in knowledge societies, particularly Open and Distance Education: What are the new needs, new trends, and new questions? How to formulate core principles of new educational resources and tools in knowledge societies and to suggest possible actions?
- On the issue of Lifelong Learning, which is its place in knowledge societies? What are the tools and resources needed? How to formulate core principles for Lifelong Learning in knowledge societies and to suggest possible actions?

The speakers have been invited to consider the action items in WSIS Draft Action. Most of them relate to the abovementioned themes and, in general, to the involvement of UNESCO and other bodies in the process of integrating ICTs to enrich innovation process for Information Society, thus, to contribute to the emerging Knowledge Society.

The speakers have been requested to end their presentation with some principles and recommendations.

A final discussion should then lead to a short list of strong principles and recommendations from Session II.



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## BRUNNSTEIN, Klaus

**President of the International Federation for Information Processing (IFIP) (2002 – Present)**

**Professor for Application of Informatics, University of Hamburg, Germany (1973 – Present)**

**Field:** Social implications of computing, esp. ethics

### Professional Career:

- 1969 – 1973: Secretary, commission for the foundation of Institute for Informatics at Hamburg university, working group on “Informatics aspects of Computer-supported Learning”
- 1965 – 1973: Computer Center, coordinator of system and networks for High Energy experiments, German Electron Accelerator (DESY), Hamburg
- 1962 – 1965: University of Hamburg, Institute for Shipbuilding, doctoral work on theoretical hydrodynamics of ship propulsion



### Educational Background:

- 1967: Doctoral degree (Dr. rer. nat. in Theoretical Physics/Applied Mathematics)
- 1962: Diploma in Theoretical Physics

**Born:** 1937

## EDUCATION FOR KNOWLEDGE SOCIETIES: LEARNING TO WORK WITH INSECURE INFORMATION AND COMMUNICATION TECHNOLOGIES

Only now, 60 years after the advent of first computers in universities and enterprises, modern Information and Communication Technologies (ICTs) have invaded many areas of education, enterprises, organisations and government, as well as individual and social life, at least in the developed spheres. At the same time, modern computer and communication devices have contributed significantly to reshape structures, tasks and requirements in all kinds of institutions with the benefits for new fields of production and service but with the losses of traditional jobs and enterprises. There is no doubt that the next generation of computing and communication devices will keep invading many – if not all – areas, and their application will continue to change contemporary structures and tasks further.

With special focus upon the development of interoperable and distributed applications, traditional ways of computing will be modified in favour of innovative infrastructures where computing devices are a commodity deeply embedded and hardly distinguishable from devices, services and functions. Consequently, such systems will become even more complex, difficult to understand and control. As this development will take place on a global scale, its pace and direction can hardly be controlled by local or regional mechanisms such as laws and regulations.

It is well known that today Information and Communication Technologies are so complicated that even experts have difficulties to understand their work, and especially to recognize why and when such systems misbehave. Every computer user knows that contemporary ICT systems rather often fail to work properly and even crash, and that these systems tend to misbehave, especially in instances least suited for a user (well known as “Murphy’s laws”). While many regard the Internet as an infrastructure to support human hopes for more democracy and self-determination, most – if not all – users have experienced the invasion of malicious software – viruses, worms, Trojan horses – and other malign content – spamming, spyware, unwished marketing – in their local systems. It is also broadly known that most of these problems are based on the insufficient quality of software, and that some are deeply inherent in design faults, e.g. of the Internet Protocol, which permits address spoofing, content sniffing and many forms on attacks on useful e-services.

With further increase of system and software complexity, weaknesses of contemporary technologies — aka<sup>1</sup> “InSecurity” — will unavoidably grow in the same way. It implies that the first affect of growing complexity will make impossible to understand the details of how devices and functions, systems and software actually work. Moreover, the second consequence is that the unwished side effects — incidents or attacks — will be a part of future work with the ICTs. In principle, complexity and insecurity may be reduced by proper design, implementation and usage, but the contemporary methods used to develop next generation systems are not adequate to help containing these technological risks.

Unavoidable, mounting complexity will lead to an equally growing dependence of all kinds of institutions and individuals on ICTs. Meanwhile, increasing faults of systems and software will lead to likewise growing vulnerability of institutions and individuals. This raises the question how users can learn to use the overly complex and insecure technologies for the best of their institutions and themselves.

Very often the answer is: “adequate” education with significant change in focus though.

The 1st lesson to learn (and to implement in curricula) is: contemporary ICTs are a major part of everybody’s life. Therefore, ICT literacy (which is significantly more than contemporary computer and media literacy!) is a MUST for everybody. Moreover, this applies also to pre-school education. Consequently, usage of ICTs must become an object of education as early as in families and kindergarten to be continued in school.

Being well-known and accepted, the 2nd lesson is less understood: as ICTs are so complex, there is NO HOPE that users can EVER understand what is going on in deep layers of these devices, network layers and systems. Consequently, education must essentially help make users be aware how best to control whether their devices and services do what they are expected to do. It means: rather than teaching how to program, schools must concentrate on the tools and methods with which information is processed, stored and transmitted.

The 3rd lesson is that the usage of modern ICTs will be accompanied by unwished — if not malevolent and sometimes criminal-intended — side effects. Consequently, education must help children be always aware that the results of their ICT-based work may not be what they expect or should get. Consequently, education must help children and students develop attitudes of due care and plausibility control.

Proper education will be important to enable individuals to take advantage of the benefits of these technologies, as well as they must become aware of the risks and short-comings. Similarly important will be the fact that the related technologies — even if overly complex and insecure — will be developed and used with respect for individual and social needs. Consequently, ethics of ICTs and its usage must also be a major subject in education.

*Remark:* this paper reflects the personal view of the speaker, based on his background as a specialist in ICT security with the focus on risk analysis/risk management, analysis of ICT incidents and attacks, and as a teacher and expert in Forensic Informatics. It does not reproduce the views of IFIP community as represented by IFIP Technical Committee TC-3 “Education”.

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<sup>1</sup> aka - also known as



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## LOING, Bernard

Intergovernmental Liaison Officer and General Delegate of the International Council for Open and Distance Education (ICDE) at UNESCO

President of Canal EF, the digital satellite radio channel for French-speaking Africa

Chairman of the Institute for Information Technology at the Francophone Agency

Expert for the implementation and the applications of ICT in education and training:

- at the Conference of European Rectors;
- at the European Union;
- at UNESCO.



**Field:** Information and communication technology, ICT applications to education and training, open and distance learning

### Professional Career:

- 1990 – 1993: Rector of CNED (Centre national d'enseignement à distance), France  
Member of the High Council for Information Technology, Ministry of Industry, France  
Expert in Educational Technology
- 1986 – 1990: Inspector General and CEO of French Post & Telecommunications Company for Overseas Territories
- 1981 – 1985: Deputy Minister of French Post and Telecommunications
- 1965 – 1985: Professor at the universities of Caen and Tours

### Educational Background:

- 1998: Doctoral degree
- 1959: Undergraduate degree, Ecole Normale Supérieure, La Sorbonne, Paris

**Born:** 1932

## TEACHER'S TRAINING: CENTRAL CHALLENGE FOR KNOWLEDGE SOCIETIES

By stepping forward from the stage of “information” to that of “knowledge” society, human communities choose to put the teacher back at the core of their system. Being a central figure in a “knowledge society”, the teacher has to fuel it with vital substance by assimilating, expanding and disseminating knowledge through various educational channels. In this capacity, no machine can substitute him. Whereas huge amounts of “information” can be efficiently stored and delivered by means of ICT systems, no such system, however sophisticated, can fully take over the role of a teacher and knowledge mediator. The central function of the human teacher is even more obvious in less developed countries where technologies are rare.

Yet, if they cannot replace the teacher, ICT can, nevertheless, provide powerful tools to support education, either in specialised learning environments, or in open and distance education facilities. In countries where teachers are scarce and often lack proper training, such environments and systems, as available, must be used in priority for teachers' training, to enable them to upgrade their competence and qualification.

Obviously, in such a process the situation of “digital divide” must be taken into account, for digital development can be very different from one country to another. But even in those parts of the world where ICT is less developed, an adequate resort to available resources, such as radio or TV channels, satellite network, and adequate programmes and software, can prove remarkably efficient and economical. They can help train, qualify, and empower the generations of teachers, tutors and trainers; they can comfort those who sometimes have to work in precarious situations.



Although the new methods prove efficient for training future or already working teachers, the recourse to ICT is not always easily accepted by academic authorities in charge of delivering the final degrees. They are often reluctant to accept the flexible and modular approach of new modes of teaching and training, and sometimes consider them an undue replacement of the professor's voice and authority. Thus, a general recommendation in favour of ICT use is not enough. The training sessions should always be concluded with an official validation process and regular degrees providing the teacher with a proof of better competence, and the guarantee of a better career.



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## WEERT, Tom J. van

Associate Professor holding the Chair “ICT and Higher Education”, Hogeschool van Utrecht, the Netherlands (2002 – Present)

**Field:** Higher education ICT-integrated learning environments for Lifelong Learning

### Professional Career:

- 1998 – 2002: Director of Cetis, expert center for educational innovation and ICT, Hogeschool van Utrecht, the Netherlands
- 1990 – 1998: Director of the University School of Informatics, Faculty of Mathematics and Informatics, University of Nijmegen, the Netherlands
- 1985 – 1990: Coordinator of the programme “Informatics for Alpha- and Gamma Sciences” of the Department of Informatics, University of Nijmegen, the Netherlands
- 1972 – 1985: Member of staff and member of the board of the Institute for Teacher Education “Ubbo Emmius”, Groningen, the Netherlands
- 1971 – 1972: Vice-head of the computer section of the TNO Physical Laboratory, the Hague, the Netherlands



### Educational Background:

- 1971: Master's Degree (Applied Mathematics), the University of Amsterdam, the Netherlands

**Born:** 1946

## LIFELONG LEARNING IN THE KNOWLEDGE SOCIETY: IS THERE A ROLE FOR HIGHER EDUCATION?

### *The Knowledge Society and Lifelong Learning*

The growing importance of Lifelong Learning must be seen against the background of profound changes, reflected in all aspects of our living environment. These changes concern the global environment, as well as our personal, economic, social, cultural and political environments. Knowledge creation drives innovation in the emerging Knowledge Society. Working and learning come together just as living and learning. The Knowledge Society is ‘an enterprising’ society in which one’s initiative and personal fulfilment are important driving forces. ICT is integrated in all aspects of the Knowledge Society.

Lifelong Learning is a ‘must’ in the real-life context of the Knowledge Society and covers “all purposeful learning from the cradle to the grave” of very diverse groups of learners in professional, community, or individual context. The Lifelong Learning environment has specific characteristics and is strongly supported by Information and Communication Technology.

Moving from industrial to knowledge-intensive economies there is in the professional context a need for modern professionals: knowledge workers with new qualifications. For the modern professional, lifelong working is identical to lifelong learning; the modern professional is a learning professional. Innovation is the driving force in a knowledge-intensive economy and for innovation new knowledge is needed. The modern professional, therefore, is a knowledge creating professional or knowledge worker.

### *ICT-integrated Knowledge Society*

“The concepts of ‘knowledge economy’ and ‘knowledge worker’ are based on the view that information and knowledge are at the centre of economic growth and development. The ability to produce and use information effectively is, thus, a vital source for skills of many individuals (OECD 2000b).



Technological change and innovation drive the development of the knowledge-based economy through their effects on production methods, consumption patterns, and structures of economy: both are closely related in recent growth performance. Some changes in innovation processes could not have occurred without ICTs and, conversely, some of the impact of ICTs might not have been felt in the absence of changes in the innovation system (OECD 2000a). These changes also have affected the way, in which organisations interact in the economy, with networking, co-operation and the fluid flow of knowledge within and across national borders gaining in importance. (OECD 2001; p. 100/101)”

“To adapt and maintain competitiveness in response to changing consumer preferences and technological change, companies need appropriate organisational structures, a skilled workforce and able management. These changes are having a significant impact on the structure of employment and on the type of labour required. The most obvious manifestation of this is the rising human capital levels of the populations and workforces in OECD countries, as measured by the educational attainment and as implied by an increased demand for more highly-educated and highly-skilled workers.”(OECD 2001; p. 102)

### ***Working is Learning and Knowledge Creation***

Thus, knowledge creation is becoming a normal part of the work of knowledge workers. “In the knowledge economy the term knowledge was used originally to denote scientific knowledge. However, partly under the influence of Information and Communication Technology the concept of knowledge is broadening: knowledge, wherever it is stored, becomes available. Knowledge in the heads of or hands of workers can be codified; tacit knowledge can be a commercially valuable asset” (WRR 2002; p. 22; author’s translation). Mass distribution of ICT and the Internet seem to contribute to the development of new knowledge and new attitudes towards knowledge. The concept of knowledge has been extended from purely theoretical knowledge (old knowledge) to knowledge that is more practice-oriented (new knowledge). (WRR 2002)

“A knowledge-based economy relies primarily on the use of ideas rather than physical abilities and on the application of technology rather than the transformation of raw materials or the exploitation of cheap labour. Knowledge is being developed and applied in new ways. Product cycles are shorter and the need for innovation – greater. Trade is increasing worldwide, increasing competitive demands on producers.” (World Bank, 2002b, p.ix). In the knowledge economy, change is so rapid that workers constantly need to acquire new skills. Firms need workers who are willing and able to update their skills throughout their lifetimes.

To keep up with developments in a knowledge-intensive economy (knowledge) workers need to adapt continuously to new developments: they are in a process of Lifelong Learning. “In the old economy, the basic competences of the industrial worker, bricklayer, or bus driver were relatively stable. True, you might have applied these competencies to different situations, such as different construction sites, but the learning component of your labour was small. In the new economy, the learning component of work becomes huge. ... Think about your own work. Work and learning overlap for a massive component of the workforce.” (Tapscott 1996, p. 198).

### ***Higher Education***

Higher Education, as a breeding place of *modern professionals*, needs to redefine its role. The more so, because a new generation of students is in the making: the *media generation*. Lifelong Learning is **not** going to an educational institution all your life. Higher Education institutions will have to open up to the knowledge society, the place where it is happening.

“In traditional industries most jobs require employees to learn how to perform routine functions, which, for the most part, remain constant over time. Most learning takes place when a worker starts a new job. In the knowledge economy, change is so rapid that workers constantly need to acquire new skills. Firms can no longer rely solely on new graduates or new labor market entrants as the primary source of new skills and knowledge. Instead, they need workers who are willing and able to update their skills throughout their lifetimes. Countries need to respond to these needs by creating education and training systems that equip people with the appropriate skills.” (World Bank, 2002b, p.xi)

“To keep up with demands and competition, innovative businesses and organisations have to create new operational knowledge in their domain: how to do better and how to offer new products and/or services. In these *learning organisations* work is organised in non-traditional ways and professionals work in a different way. A shift can be observed from organisational structures suited for efficient, standard, large-scale throughput (Tayloristic, old economy) to structures that facilitate flexible,



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custom-tailored, small scale, high quality production or servicing (networked, new economy). These new organisational structures aim to satisfy a personal, demand-driven market and are reflected in organisational concepts such as “Just In Time”. The new structures are geared towards teamwork, flexibility and quality. Information and Communication Technology (ICT) is omnipresent and empowers the individual to act as expert in many areas. ICT also offers flexibility in time and place in support of teamwork.” (Weert 2003).

The paradigm of the *learning organisation* may also allow Higher Education to serve both initial phase, and lifelong learning students. *Real-life situation-based learning environments* may well be the materialisation of this new paradigm.

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## LANGLOIS, Claudine

Director of the International Association of Universities (IAU)/UNESCO Information Centre on Higher Education, Paris, France (1989 – Present)

Rapporteur of the IAU Working Group on Information and Communication Technologies

**Field:** Education, information sciences

### Professional Career:

1970 – 1989: Librarian, International Association of Universities, Paris

1968 – 1970: Junior teacher, Université de Montréal, Québec, Canada

1965 – 1967: Secondary school teacher, Rouen, France

### Educational Background:

1970: Librarianship, Université de Montréal, Québec, Canada

1969: Master of Arts (English), Université de Montréal, Québec, Canada

1965: Undergraduate degree (English), Université de Caen, France

**Born:** 1943



## FACILITATING LIFELONG LEARNING IN UNIVERSITIES: THE ROLE OF ICTs

Higher education institutions are facing tremendous challenges because of the requirements of an emerging knowledge-based society closely linked to the pressing need of lifelong learning (LLL).

There are several definitions of lifelong learning, the one of European Commission being considered the most comprehensive: “All learning activity undertaken throughout life, with the aim of improving knowledge, skills and competence within a personal, civil, social and/or employment-related perspective.”

### *Changes in Knowledge*

- *Knowledge and economic development*

It is now recognized that economic development is increasingly linked to the accumulation of knowledge; therefore, more and more funds are allocated to training and research. User's demand for training and retraining throughout life is also growing everywhere. Consequently, particular attention has been paid on lifelong learning by governments – predominantly in Europe (European Commission 2003) – many of which have developed policies in this area.

- *Need for higher level skills*

In knowledge-driven economies, individuals need more specialized skills of higher level. To update skills, continuous retraining is necessary. The traditional approach of graduating in a certain field in early adulthood to get a job is changing for lifelong learning practices.

### *Consequences for Universities*

These changes profoundly affect universities. It is commonly held that they have to become more flexible and adopt new methods to cope with the evolution of needs, particularly those of new types of students (working, mature, stay-at-home, etc.) who wish to update and refresh their knowledge – sometimes very specialized – to change career or to broaden their education without being constrained in time, location and even finance. For UNESCO (World Conference on Higher Education, 1998), the role of universities and higher education goes further than training students: the central task of higher education is “training



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and educating in a long-term perspective with an eye to a contribution by individuals to social and economic developments through citizenship education and lifelong training”.

In Western Europe alone, more than half of the universities have developed or are starting to develop an overall lifelong learning strategy. Other 25% are planning to develop one.

In particular, this policy affects:

- 1) access: many institutions are too crowded to accommodate more students – How can they open up to people who wish to study on demand during their lifetime?
- 2) teaching and learning (need of new curriculum concepts and alternative ways of delivering courses to secure more flexibility);
- 3) academic staff: with cost restrictions and limited recruitment, teachers must be more efficient and flexible in changing their methods;
- 4) costs.

## **What Is the Answer?**

In many cases, ICTs are the answer:

- *In access*: “distance” and “virtual” courses allow a growing number of students to access higher education, in remote areas and at any time.
- *In teaching and learning*: its efficiency, many agree, is increased with ICTs.
- *For academic staff*: with the use of educational software, teachers serve as guides rather than lecturers and transmitters of knowledge. Less academic staff is necessary but they have to be trained to use ICTs.
- *In matters of costs*: although investment in equipment and course development is more costly, it is believed that teaching will eventually become cheaper.

## **“Distance” and “Virtual” Universities**

The last three decades have seen more distance institutions, starting with Open Universities using radio and television (such as the ones in the United Kingdom, India, Thailand, Venezuela, Spain, Israel, Iran, South Africa and China) to the more recent establishments using advanced technology at various levels of “virtualization”.

Tschang and Della Senta (2001) have identified the following main levels: Brokerage, Partnership, Network, Dual Mode or entirely “Virtual” institutions.

## **Need for Strategic Planning**

In all cases, strategic planning is needed in order to be successful in implementing such programmes. An example is to be found in the University of Phoenix. Its success, explains Salmi (2001), has been the result “of a well-thought strategy involving a business model of university governance and management, a targeted clientele of working adults, a small number of professionally oriented programs, flexible arrangements to give credit for prior knowledge and experience”. Another successful model is Carnegie Mellon University with its wireless campus network. In contrast, due to the lack of strategic planning, many new distance education institutions, particularly in the USA, adopted inappropriate technologies, failed to assess their needs and had to close down.

In Europe, the European University Association (EUA) has conducted a programme “New Technologies for Teaching and Learning: Guidance to Universities on Strategy”, which lists the criteria which have to be taken into consideration to implement ICTs in universities.

## **Conclusion**

The IAU draft statement “Universities and ICTs” stipulates that “universities have been at the forefront of ICT developments as well as among the leaders in integrating and adopting these technologies”. In its plan of action WSIS

mentions universities or higher education explicitly when referring to lifelong learning policies (C4. Capacity Building, 17, Actions a)).

On their part, universities should develop and continuously update institutional ICT policies in order to provide all members of the academic community and non-academic staff with skills to use the up-to-date ICTs. Sufficient and on-going funds should be allocated to ensure that all students as well as adults wishing to pursue lifelong learning are provided with the relevant ICT skills.

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## SENTENI, Alain

**Director of the Virtual Centre for Innovative Learning Technologies (VCILT), University of Mauritius (2001 – Present)**

**Field:** ICT in education, e-learning, computer-mediated communication and pedagogy, pedagogical engineering, visual communication, multimedia, activity theory, collaborative approaches, CSCW, CSCL, ICT for development



### **Professional Career:**

1996 – 1999: Professor, School of Fine Arts and Visual Communication, Réunion Island

1989 – 1995: Professor, Faculty of Education Science, University of Montreal, Canada

### **Educational Background:**

1995: H.D.R. (Habilitation à Diriger les Recherches en Informatique – Enabling to Conduct Research in Computer Science, Institut National Polytechnique de Toulouse (INPT), France

1989: Ph.D. in Computer Science, Institut National Polytechnique de Toulouse (INPT), France

1969: Computer Science Engineer, Ecole Nationale Supérieure d'Informatique, Electronique, Electrotechnique et Hydraulique de Toulouse (ENSEEIH-T-INPT)

1968: Masters' Degree in Computer Science, Université Paul Sabatier, Toulouse, France

**Born:** 1947

## TECHNOLOGY-ENHANCED EDUCATION, OPEN EDUCATIONAL RESOURCES AND NON-FORMAL APPROACHES TO LIFELONG LEARNING FOR SUSTAINABLE DEVELOPMENT

*Keywords: Technology-Enhanced Education, Open Educational Resources, Open Systems, Educational Virtual Communities*

“Wiring itself as a global hub for information and communication technology” (quoting TIME Magazine, July 2002), Mauritius today finds itself at the convergence of major research, development, social and cultural issues. Questions are now raised about the future of education in the knowledge economy regarding the access to technology, sharing of knowledge, synergy of human resources and approaches that will help developing countries become producers and active players in the knowledge building process.

Departing from an “e-learning vision” that puts technology at the centre of the development process, Technology-Enhanced Education intends to propose a systemic and evolutionary view of education, through pragmatic approaches in which sustainable human resource development remains central. Capacity emerges from the synergy between availability of resources and technologies, commitment to meaningful projects and building up of communities to bring these projects to life.

Technology-Enhanced Education relies on Open Educational Resources (OER) initiatives based on a philosophical view of knowledge as a collective social product to become a social property. A year ago, UNESCO in association with the William and Flora Hewlett Foundation and WCET, the Western Cooperative for Educational Telecommunications, convened a forum on the Impact of Open Courseware (OCW) on Higher Education in Developing Countries. The OpenCourseWare initiative of the Massachusetts Institute of Technology, a principal point of interest at the forum, consists of providing educational resources for free consultation and non-commercial usage by university and college faculty members as well as students, with permission to produce adapted versions. It also includes the technology to support an open access to and meaningful use of these resources.

Beyond mere sharing of knowledge and provision of technology, the need is now urged to place the individual at the center of the development objectives. Mindsets must be changed. From simple interactive customers (*consumactors*), learners must be turned into reflexive and creative practitioners<sup>1</sup>, in an ongoing process reconciling a culture of knowledge with one of development. In this respect, the technology appears a privileged tool (instrument) through which value can be added to existing resources, new knowledge can be built and social link can be created:

- to make effective the research impact and technology transfer onto the socio-economic environment;
- to develop methodologies grounding the relationship between society and technology to allow for action and innovation;
- to support and emphasize emerging socio-cultural and educational processes, along with cultural diversity and creativity.

In this respect, some major technology-enhanced educational projects are currently under development in Mauritius, aimed at capacity building through community development and networking and making education more accessible. Non-formal approaches for lifelong learning are being set up in collaboration between the Virtual Centre for Innovative Learning Technologies (VCILT) of the University of Mauritius and the National Productivity and Competitiveness Council (NPCC). The mass Computer Proficiency Programme (CPP) was started in October 2002 allowing to train about ten thousand school teachers and public servants through the hands-on forty-five-hour programme "Introduction to ICT".

As a follow-up of CPP, other lifelong learning technology-enhanced programmes are now being launched, involving MIT-OCW, the emerging project of the Commonwealth of Learning (COL) Virtual University for Small Island States, the hands-on *La main à la pâte* project with the French *Ecole Normale Supérieure* in Paris, and several other networks of Learning Object Repositories (LOR) enabling users to interoperate and reuse computerized resources.

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<sup>1</sup> Schön, D. (1983) *The Reflective Practitioner*, New York, Basic Books



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## JOHNSTONE, Sally M.

**Executive Director, Western Cooperative for Educational Telecommunications (WCET), Western Interstate Commission for Higher Education (WICHE), Boulder, CO, USA (1989 – Present)**  
**University of Texas Telecampus, Advisory Board (2002 – present)**  
**Open Learning Journal, Editorial Board (2001 – present)**



**Field:** National, regional and institutional policies relating to the integration of technologies into colleges and universities (including quality assurance, non-academic and academic services, costing issues, and management issues)

### Professional Career:

- 2001 – 2002: Science Support Advisory Board, Raytheon Polar Services
- 2000 – 2002: The Leadership Group, Southern Regional Education Board's Distance Learning Policy Laboratory
- 1999 – 2001: Consortium for the Advancement of Private Higher Education Advisory Board
- 1998 – 2002: Board of Directors, American Association of Higher Education
- 1998 – 2002: Board of Directors, United States Open University
- 1998: Co-chair of the National Postsecondary Education Cooperative (NPEC)  
Working Group on Ramifications of Technology for Current Surveys
- 1996 – 1999: Advisor to the Executive Committee of the Western Governors University Board of Trustees
- 1986 – 1989: Director, Center for Instructional Telecommunications, University of Maryland University College, College Park, MD
- 1984 – 1986: Assistant Dean, Undergraduate Faculty, University of Maryland University College, College Park, MD
- 1984 – 1989: Faculty, Psychology, University of Maryland University College, College Park, MD
- 1982 – 1984: Lecturer (Psychology), European Division, University of Maryland, Heidelberg, Germany
- 1977 – 1978: Instructor, Department of Psychology, Radford College, Radford, VA
- 1976 – 1977: Instructor, Social Sciences Division, New River Community College, Dublin, VA

### Educational Background:

- 1982: Doctoral degree (Ph. D., Experimental Psychology), University of North Carolina, Chapel Hill, NC
- 1976: Master's degree (Psychology), Virginia Polytechnic Institute and State University Blacksburg, VA
- 1974: Undergraduate degree (Psychology), Virginia Polytechnic Institute and State University, Blacksburg, VA

**Born:** 1949

## OPEN EDUCATIONAL RESOURCES

The Massachusetts Institute of Technology is posting the substance of more than two thousand courses on the Web. It will make them available to anybody, anywhere in the world, at no cost. That is OpenCourseWare program.

In his report for the academic year 2000–2001 Charles M. Vest, MIT President, considered a straight question: “How is the Internet to be used in education, and what is your university to do about it?”<sup>1</sup> Part of MIT response is to declare that “. . . inherent to the Internet and the Web is a force for openness and opportunity that should be the bedrock of its use by universities.” The OpenCourseWare initiative results from a recognition, that “we now have a powerful opportunity to use the Internet to enhance [the] process of conceiving, shaping, and organizing knowledge for use in teaching.”

<sup>1</sup> Massachusetts Institute of Technology, Report of the President For the Academic Year 2000–2001: Disturbing the Educational Universe: Universities in the Digital Age – Dinosaurs or Prometheans?

“OpenCourseWare” (OCW), or open educational resources, does not mean online courses that students take for credit. Rather, OCW is a resource for faculty members to use as they create their electronic course materials for the students. Typical offerings consist of lecture notes, course outlines, reading lists, assignments, and similar course elements, as well as experiments, demonstrations, and students’ work. The MIT courses are in their context of sequences and programs. MIT becomes transparent out of its catalog to the structure, substance, and rigor of the courses.

Anywhere in the world, faculty members and individual learners are free to use or adapt OCW material as they see fit; the only constraints on this trove of intellectual property are that its use should be properly attributed and that it may not be used commercially without obtaining a license from the owner first.

With initial support from the William and Flora Hewlett Foundation and the Andrew W. Mellon Foundation, MIT intends a long-term commitment to institutions and individuals everywhere.

In 2002, UNESCO convened the forum in association with the William and Flora Hewlett Foundation and the Western Cooperative for Educational Telecommunications (WCET). Seventeen participants, attending in their personal capacity, were selected on the basis of their involvement in the development and practice of higher education in their countries. Eight representatives of international and non-governmental organizations as well as one academic observer took part in it.

The institutions represented at the forum suggested that an important aspect should be the collaboration in regional or international open courseware programmes. The following were among the suggestions:

- Materials for professional programmes such as Bachelor and Master’s degree programmes in Library and Information Sciences.
- Production of a portal for the African educational community to share information, course content, and make quality distance education learning products and services accessible.
- Using existing resources, develop Reusable Learning Objects as “cognitive Lego Bricks.”
- Develop collections of science experiments and industrial processes, and the resources of art galleries and historical archives.
- Develop the international intellectual resource that is constituted by scientists and professors and currently under-used in their present national infrastructure.
- Develop courses in the field of continued education.
- Collaborate with other countries in the development of case studies in international business, for example in the transition from traditional to modern business structures.
- Provide a test/evaluation environment for open courseware programmes.
- Publish links to pages created by faculty worldwide who are using the Web to deliver course materials in any language.

## **Summary**

Clearly, the international discussion about open courseware – its potential and the issues to be addressed – is both timely and pertinent. Thanks to a confluence of technology and imagination, it is now feasible to recognize that knowledge, as a social product, can indeed become an international social property, a concept that the forum explored and advanced.





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## **SESSION III**

**UNESCO as a Key Actor  
in the Development of Education  
for and in Knowledge Societies**

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## **BOLLERSLEV, Peter**

**Director and Editor-in-Chief at SAXO Publishers (2003 – Present)**

**Field:** Mathematics and informatics in teacher education

### **Professional Career:**

2000 – 2003: Chief Consultant in Gyldendal Education (Publishing House)  
1998 – 2001: President of the International Federation for Information Processing (IFIP)  
1970 – 1993: Her Majesty's Inspector for Teacher Education, Ministry of Education, Denmark  
1962 – 1999: Professor in colleges of education

### **Educational Background:**

1959: Mathematics, University of Copenhagen, Denmark

**Born:** 1936



## **PREAMBLE TO THE SESSION III. UNESCO AS A KEY ACTOR IN THE DEVELOPMENT OF EDUCATION FOR AND IN KNOWLEDGE SOCIETIES**

Three speakers at this session will contribute the ideas on how in the future UNESCO can best engage in and stimulate the development of education for and in the new kind of society we are building.

With the experience from the past as a background they will present the opinions about how Information Society can respect and at the same time overcome such obstacles as cultural diversity, linguistic diversity, digital divide, gender disparities, illiteracy, different economic opportunities, etc.

With their visions of the future in mind the speakers will recommend certain important items to be included in a strategic plan of action for mutual development toward the realization of Knowledge Society as a society where citizens are prepared for life through education, where the conditions are at their optimum.

The power of ICTs in the process will be defined and described as well as how ICTs can benefit the world and, particularly, be used to improve the quality of life for the majority of peoples who live in LDCs, despite the digital divide between the rich and the poor, urban and rural societies, men and women, and different generations.

In this session they will consider and comment on a number of specific themes, which are the suggestions that UNESCO should undertake a specific role and responsibility for action within its field of competence:

1. UNESCO should establish an information bank where experiences in the use of ICTs in education are collected and grouped according to comparable environments and circumstances.  
As a part of this approach a "Handbook of Good Practices and Success Stories" could be developed and launched, based on compilation of contributions from all stakeholders, in a compelling format. The handbook could be re-issued periodically and turned into a permanent experience-sharing exercise.
2. In collaboration with other international agencies UNESCO should set up models of in-service training and professional development of teachers who make effective use of the approaches, facilities and opportunities provided by ICTs.  
This is in line with the spirit of the "Education for All" action plan.  
It will help define, which education is needed in Information Society and, what is learning and teaching in Knowledge Society.



3. UNESCO should develop strategies to establish an infrastructure for ICTs in LDCs, which would help in fighting illiteracy through Lifelong Learning projects. UNESCO should advise governments on comprehensive and forward-looking strategies to be developed in response to new human needs, including the creation of an environment that supports information and ICT literacy, Lifelong Learning for public at large. Everyone should be offered an opportunity to acquire the necessary skills in order to understand, participate actively in, and benefit fully from Information Society and the knowledge economy. This is a matter of “Capacity Building for All”.
4. UNESCO should develop strategies to use ICTs in education in order to overcome gender disparities, especially in LDCs. The Information Society should be subject to universally held cultural and ethical values such as truth, justice, solidarity, tolerance, human dignity, shared responsibility, transparency and accountability. The use of ICTs can facilitate social integration of excluded segments of societies.  
The use of ICTs for education and human resource development, in both formal and informal learning environments, should be promoted, with a special reference to the requirements of disadvantaged groups, and to the specific needs of girls and women. UNESCO should, therefore, advise governments how to design, develop and adapt ICT infrastructure, tools and applications that are responsive to the needs of the poor, including women.

The speakers have also been invited to consider the action items in WSIS Draft Action. Most of them relate to the above-mentioned themes and, in general, to the involvement of UNESCO in the process of using ICTs to let the Information Society encompass LDCs.

The speakers have been requested to end their presentation with some principles and recommendations.

A final discussion should then lead to a short list of well-built principles and recommendations from Session III.

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## SENDOV, Blagovest

Ambassador of Bulgaria to Japan (2003 – Present)  
Academician of the Bulgarian Academy of Sciences

**Field:** Computer science, mathematical modeling, approximation theory

### Professional Career:

1994 – 2003: President, Vice President of the Bulgarian Parliament  
1989 – 1992: President of the International Federation for Information Processing (IFIP)  
1979 – 1992: General Secretary, President of the Bulgarian Academy of Sciences  
1958 – 1979: Assistant Professor, Professor, Dean and Rector of Sofia University

### Educational background:

1964: Doctoral degree (Approximation Theory), Sofia University, Bulgaria  
1960: Master's degree (Computer Science), Sofia University, Bulgaria  
1956: Undergraduate degree (Mathematics), Sofia University, Bulgaria

**Born:** 1932



## THE CHALLENGES FOR EDUCATION AND KNOWLEDGE IN THE INFORMATION SOCIETY

Knowledge has always been important for human beings. Why has the present period of human history been named “The Age of Knowledge”? The attempts to answer this question will help us define the problems to be discussed. Only after the building of extremely powerful machines for automatic transformation of information, the time for Knowledge Societies came. Knowledge is a category of information created in the human mind. Attempts, as Artificial Intelligence (AI) for automatic transformation of knowledge, bring the necessity to differentiate between the natural knowledge in the mind of a human being and the “artificial” knowledge stored in books or computer memories. Knowledge society is a society in which the level of knowledge of every individual is comparable. The economic prosperity of the members of such society depends primarily on the knowledge skills of the individual. What is knowledge? This question is discussed, from the philosophical point of view, in the epistemology and, from the business point of view, in the art of Information systems. There is no uniformly accepted definition of what knowledge is. In the Information age we have to work with different kinds of knowledge. A philosophical definition is useless within the business context.

The deep understanding of the physiological, psychological and sociological mechanisms for transferring and creating knowledge is decisive in establishing appropriate educational practice for a Knowledge society. The role of UNESCO in this direction is indispensable. The long history and experience of this respected world organization in coordinating the activity in education and scientific research will help solve difficult problems of redefining the educational goals and means in a Knowledge society. UNESCO is instrumental for studying and evaluating the experiments with the new forms of education and knowledge dissemination for the benefit of all countries, especially the developing countries. It is of interest to diminish the so-called digital divide as a result of the Information age. The first priority in a Knowledge society must be the education. The computer must be considered an extension, not a replacement, of the human mind. Educational methods must be adopted for students enforced with means for automatic transformation of information. The social status of educators must be much higher.



## RUDGARD, Stephen

Chief, WAICENT Outreach, Library and Documentation Systems Division, Food and Agriculture Organization of the United Nations (2000 – Present)

**Field:** Agricultural information management

### Professional Career:

- 1990 – 2000: Director, Information for Development, CAB International, United Kingdom
- 1985 – 1990: Project Liaison Officer, International Witches' Broom Project, International Office of Cocoa and Chocolate, United Kingdom
- 1982 – 1985: Plant Pathologist, Interamerican Institute for Cooperation on Agriculture, Brazil

### Educational Background:

- 1982: Doctoral degree (Plant Pathology), University of London, United Kingdom
- 1979: Master's degree (Botany), University of London, United Kingdom

**Born:** 1958



## MANGSTL, Anton

Director, Library and Documentation Systems Division, Food and Agriculture Organization of the United Nations (1996 – Present)

**Field:** Agronomy and information management

### Professional Career:

- 1989 – 1996: Director, Centre for Agricultural Documentation and Information (ZADI), Bonn, Germany
- 1975 – 1989: Deputy to the Head of the working Group on Crop Production and Informatics in Agriculture in Freising-Weihenstephan (Germany), Center for Life and Food Sciences
- 1970 – 1975: Technical employee and student assistant – Freising-Weihenstephan (Germany), Centre for Life and Food Sciences

### Educational Background:

- 1978: Doctoral degree (Agronomy), Freising-Weihenstephan, Germany
- 1975: Master's degree (Agronomy), Freising-Weihenstephan, Germany
- 1970: Undergraduate degree (Agricultural Engineering), University Landshut-Schönbrunn, Germany

**Born:** 1949



## FAO-UNESCO PARTNERSHIP ON E-LEARNING FOR INFORMATION AND KNOWLEDGE MANAGEMENT

### Background and Substance of Intervention

Many organizations and networks have been heavily involved in improving and supplementing existing capacities and skills in support of the new methods of work in the information society. However, due to the ever-increasing demands for assistance

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in establishing or improving capacities of information systems and more effective use of ICTs, the human resources available for capacity building and training have become insufficient to meet the identified needs. In 2001, in response to the increased demand in the specific area of agriculture and food security, FAO initiated the distance learning programme known as Information Management Resource Kit to train individuals in the effective management and exchange of digital information through distance learning. The Resource Kit uses the latest methods of interactive e-learning adapted to self-paced education, hence obviating the need for a tutor to accompany the learning process. The modules will be supplemented by the extensive web site providing updates and user support, as well as an Internet-based virtual community for contributors and learners, allowing them to exchange information, and to collaborate with other professionals.

The Resource Kit is being developed and sustained by FAO in a consultative process with contributing partner organizations, and UNESCO is a principal member of the partnership. The Resource Kit and its contents are being designed in response to clearly articulated needs of different target user groups, and are based on assessments and analyses already conducted by FAO and its partners. The Resource Kit will be delivered as a computer-based distance learning resource made up of a series of discrete modules on CD-ROM or downloadable from the Internet, each module containing one or more interrelated topics. The curriculum for each module is being designed and developed by subject-matter experts, through consultative workshops and by correspondence. Software applications and tools developed by partner organizations are also being provided with each module. The Resource Kit contains only non-proprietary materials and is made available free of charge.

The Resource Kit module being developed by UNESCO in partnership with FAO will be a feature of the presentation.

## **Format:**

Short PowerPoint Presentation followed by brief demonstration of a Resource Kit Module. (Total duration 10 minutes)



## FOUILHOUX, Monique

**President of the NGO-UNESCO Liaison Committee and President of the International NGOs Conference (1998 – Present)**

**Field:** Teacher training, international cooperation

### **Professional Career:**

1993 – 1998: Education International, the International Federation of Teacher and Educational Personnel Unions based in Brussels, Belgium

1973 – 1984: Member of the teaching and research team of the University Center for Further Education for Adult



### **Educational Background:**

Law graduate, the University of Clermont-Ferrand, France

**Born:** 1945

## ICTs IN KNOWLEDGE SOCIETIES: A TOOL FOR ACCESS, EQUITY AND QUALITY

### **Introduction**

UNESCO has official relations with 329 international and regional NGOs acting in the scope of competence of the organisation. They form International Conference, which meet every two years to elaborate collective perspectives of work relevant to UNESCO's programmes. They elect Liaison Committee and President. Within this framework NGOs have been actively collaborating with UNESCO during the last 20 months to prepare the Summit. Meetings and online consultations have been successfully carried out with the financial and technical help of UNESCO. The results have been forwarded to the Geneva Preparatory Committee.

### **ICTs: a Tool for Access, Equity and Quality**

In Dakar three years ago, World Education Forum adopted a framework for action. Participants committed themselves "to achieve education for all (EFA) goals and targets for every citizen and for every society". To attain the six goals adopted, they pledge themselves to "harness new information and communication technologies to help reach EFA goals".

### **Principles**

- Universal access must be ensured anytime for anybody in all regions for affordable costs.
- ICTs in education must be considered a support/interface/delivery system to facilitate exchange between teachers and learners.
- Training of teachers to use distance learning methods must be a priority.
- Important information/educational material must be easily accessible (exemptions of copyright).
- Diversity of educational hard and software must be ensured and not exclude other/traditional supports.

### **Actions**

- Identify strategies of a specific country to use ICTs in education and employ public locations/institutions as access points to educational resources.
- Foster research on impact of ICTs and education (comparative, cross cultural and cross regional studies).
- Improve teacher training by providing ICT facilities in teachers' training institutions in developing countries.
- Create awareness of governments on the issue of copyright/exemptions to copyright in the education sector.
- Develop affordable hard/software tailored to the needs of education and promote the combination of various media.



# **Towards Societies**

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## UNESCO INSTITUTE FOR INFORMATION TECHNOLOGIES IN EDUCATION (IITE)

**Status:** UNESCO education institute established in November 1997, integral part of UNESCO

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### ***The establishment of IITE***

The UNESCO Institute for Information Technologies in Education (IITE) was established as an integral part of UNESCO by the General Conference of UNESCO at its 29th session (November 1997) and is located in Moscow, Russian Federation. At the same session, the Statutes of IITE were adopted.

In his note of 26 March 1998 the Director-General of UNESCO announced the establishment of the UNESCO Institute for Information Technologies in Education and set terms to form the IITE Governing Board.

### ***The Governing Board***

In accordance with the IITE Statutes, the IITE Governing Board consists of eleven members appointed by the Director-General of UNESCO on a geographical distribution basis that is as equitable and as wide as possible. At present the IITE Governing Board consists of the following Board Members: Prof. Dr Saleh Abdulrahman Al-Athel (Saudi Arabia) – Chairperson, Prof. Vaino Brazdeikis (Lithuania), Prof. Bernard Cornu (France) – Vice-Chairperson, Prof. Xingfu Ding (China), Prof. Avram Eskenazi (Bulgaria), Prof. Vladimir Filippov (Russian Federation), Prof. Karel Kveton (Czech Republic), Prof. Diana Laurillard (United Kingdom), Prof. Galym Mutanov (Kazakhstan), Prof. Michael Zgurovsky (Ukraine) – Member of Executive Committee, and Prof. Alexander Zhuk (Belarus).

### ***IITE's mission***

IITE's mission is to *strengthen the national capacities of UNESCO Member States for applying ICTs in education*. For these purposes the Institute:

- promotes *collection, analysis, dissemination and exchange of information* on the use of ICTs in education;
- provides at the request of Member States *advisory services* and promote *studies* in Member States on the application of ICTs in education;
- offers *technical assistance based on research findings in the design of curricula and courses* on the use of ICTs in education;
- organizes *pre- and in-service training*, including open and distance education, for educational personnel on the use of ICTs in education, giving priority to developing countries and countries in transition;
- fosters the *development of UNESCO regional programmes* on the application of ICTs in education in all Member States and, particularly, in the countries of the Commonwealth of Independent States.

## Strategy

In accordance with its Medium-Term Strategy, IITE strives to make its contribution to the implementation of UNESCO's functions as a whole, namely, to act as: a catalyst for international cooperation, a laboratory of ideas, a clearing house, a learning organization, a capacity-builder in UNESCO Member States.

Striving to make its contribution to attaining all these aims as much as possible, within the context of the global tendencies and in compliance with its mission, IITE consolidates its efforts around the following strategic sub-objectives of the UNESCO Medium-Term Strategy 2002-2007: *Identifying new trends in educational development and promoting policy dialogue*, and *Harnessing information and communication technologies for education*. To that end, IITE pursues, in its programme activities during 2002-2007, the following **strategic objective: reinforcing national potential in ICT application for the development of education**.

## Main activities

During the Medium-Term period, IITE carries out its activities in four **main programme areas**:

- *Supporting National Capacities for ICT Application in Educational Systems;*
- *Forming an Information Environment for Education;*
- *Improving the Quality of Education through ICT Usage;*
- *Promoting ICT Usage in Education for Learning to Live Together.*

The realization of the IITE strategic objective is led in three correlated **programme activities' domains**, namely: **research**, **training** and **clearing house** activities.

**Research** on ICT application in education is regarded as the central activity. It lays the foundation for further project development, elaboration of training and methodological materials, carrying out training activities, providing assistance to UNESCO Member States in policy formulation, and in the implementation of national pilot projects, and supplying them with information in the field.

As to the **training activities**, in accordance with the Institute's strategic approach, training and retraining of educational personnel in the application of ICTs in education have been a top priority, resulting in a multiplier effect. The **main target groups** of training activities are the following: policy- and decision-makers in the educational sphere, and heads of national and regional education systems; heads of pre- and in-service teacher-training institutions, trainers of trainers for ICTs in education; and teachers, ICT school coordinators and other educational personnel. For the training activities the Institute elaborated and uses its own **education programme**, which consists of a basic course, five specialized training courses of a modular character, and sets of support training materials.

Like research and training, the **clearing house** is one of the main domains of IITE's activities. On the basis of the Institute's research and studies, IITE prepares of the analytical surveys, training, methodological and information materials on the ICT usage in education as well as the IITE Newsletter in electronic and printed forms and disseminates them in all UNESCO Member States and international organizations acting in the field of its competence. At present, IITE disseminates its publications to about 400 addresses all over the world including the National Commissions for UNESCO and 36 national focal points for cooperation with IITE, as well as IGOs and NGOs, institutes and professional communities. The **IITE information system** ([www.iite-unesco.org](http://www.iite-unesco.org)) consists of the IITE web site, "*Information System on Information Technologies in Education*" database and specialized websites for group work and communication.

## Comparative advantages

For the implementation of its strategic objective, IITE concentrates its resources on attaining real results and focuses its efforts on the activities where it has a comparative advantage and gained experience.

To provide an effective correlation between the programme activities' domains IITE uses a long-term approach to the development of its following **projects**:



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- *ICTs in Distance Education;*
- *Indicators of ICT Application in Education;*
- *ICTs in Special Education;*
- *ICTs in Technical and Vocational Education and Training;*
- *Ethical, Psychological and Societal Problems of the Application of ICTs in Education;*
- *Education, Art and ICTs: Integration for the Development of One's Personality;*
- *ICTs in Teaching/Learning Foreign Languages;*
- *ICTs in History Education;*
- *Digital Libraries for Education;*
- *Education via the Internet;*
- *Designing Information Environment for Education.*

During the period of 2000-2003 IITE fulfilled 17 long-term projects, 7 national pilot projects, 5 sub-regional projects; held 44 expert meetings, research seminars and workshops, 4 round tables. The Institute took part, co-organized and/or co-sponsored 30 international forums; carried out 36 training sessions, seminars, workshops and 15 thematic online seminars; published 66 analytical surveys, specialized training courses, sets of training, methodological and information materials.

Since 2000, about 200 experts from near 50 countries and organizations took part in the IITE research and training activities, expert meetings, research seminars and workshops. During 2000-2001 more than 1,000 educators from 18 UNESCO Member States were retrained at 17 training seminars and workshops held on the basis of the IITE educational programme. In 2002-2003 IITE organized 19 training sessions, seminars and workshops for more than 500 educators from 28 countries.

## Highlights of concrete projects

Several IITE activities should be underlined as those which have the most impact on the progress in ICT application in education. Striving to contribute to the development of national action plans on the use of ICTs for attaining the EFA goals, IITE has launched a **high-level seminar** *Towards Policies for Integration ICTs into Education* for decision- and policy-makers. The seminar was successfully implemented twice for ministers, deputy ministers and heads of relevant departments of the ministries of education in April – June 2001 in Moscow (13 countries: Armenia, Azerbaijan, Belarus, Czech Republic, Estonia, Kazakhstan, Kyrgyzstan, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Ukraine and Uzbekistan) and in Bangkok in February – April 2003 (11 Asia-Pacific countries: Afghanistan, Bangladesh, Cambodia, Indonesia, Iran, Mongolia, Pakistan, Philippines, South Korea, Thailand and Vietnam). The third seminar is planned for February – April 2004 for decision-makers and policy-makers in education from 10 South Eastern Europe countries.

The **sub-regional project** *Information and Communication Technologies for the Education Capacity Development Towards the Construction of a Knowledge Society* for the countries of South Eastern Europe started by IITE and financed by the Japanese-Funds-in-Trust is aimed at strengthening national educational capacities by harnessing ICTs for education and diversifying their application for training purposes.

Another IITE **sub-regional project**, namely *Information and Communication Technologies for Higher Distance Education Usage in Sub-Saharan Africa* financed from UNESCO Extrabudgetary Programme for Technical Services to Member States Capacity Building for Education for All (EFA) started in October 2003 in Pretoria, South Africa. Following the recommendations by the participants of the expert meetings on ICT usage in distance education held by IITE in Tanzania (2001) and Kenya (2002), the IITE specialized training course ICTs in Distance Education was adapted to the needs of countries in Africa. The trainees from 11 countries of the region as well as from IICBA effectively master ICT usage in higher distance education.

Within the framework of the World Summit on the Information Society (WSIS) (10-12 December 2003, Geneva, Switzerland) IITE is committed to organize on behalf of UNESCO Education Sector the Round Table discussion *Education and Knowledge Societies*, one of UNESCO side events at WSIS.



## CLUB OF ROME (CoR)

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<b>Web site:</b>	www.clubofrome.org
<b>Memberships:</b>	CoR is a member of UNESCO as a Formal Consultative Relations as a Network, and has applied for membership at UN-ECOSOC and CONGO

### *Mission*

The essential mission of the Club of Rome is to act as an international, non-official catalyst of change, contributing to increasing understanding and, at times, jolting the system into action. The need for a centre of innovative thinking, especially about social and cultural issues, is becoming increasingly urgent – new global issues must be identified before they appear on the international scene and then be analyzed to tackle their root causes, not merely (as so often) their consequences, and to encourage preventive measures rather than belated action. In the past, the Club has proved its competence in this role; it will do its best to continue to act so in future.

- The identification of the most crucial problems facing humanity, their analysis in the global context of the world-wide 'problématique', the research of future alternative solutions and elaboration of scenarios for the future.
- The communication of these problems to the most important public and private decision-makers as well as to the public at large.

The Club of Rome is governed by three complementary principles:

- A global perspective in examining issues with the awareness that the increasing interdependence of nations and the globalization of problems pose predicaments beyond the capacity of individual countries.
- Holistic thinking and the seeking for a deeper understanding of complexity within the contemporary problems – political, social, economic, technological, environmental, psychological and cultural – which the Club of Rome terms the world 'problématique'.
- An interdisciplinary and long-term perspective focusing on the choices and policies determining the destiny of future generations, because this perspective is too often neglected by governments and decision-makers on the account of short-term interests.

### *Who Are We and What Are Our Actions?*

The Club of Rome is "a network of world citizens, sharing a common concern for the future of humanity and acting as a catalyst to stimulate public debate, to sponsor investigations and analyses of the 'problématique' and to bring them to the attention of decision makers".



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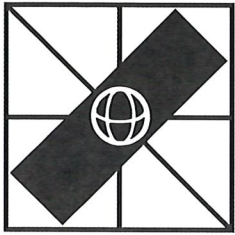
In order to reach its objectives the CoR initiates studies, organizes conferences and pursues other activities forwarding its mission. It conducts these activities through members and working groups.

The first report published by the Club of Rome *The Limits to Growth* in 1972 drew the attention of the whole world – the business, the political leadership, and the civil society – to the fact that the earth has a limited ecological carrying capacity as well as limited resource availability. Mankind must be cautious with the use of the natural resources and take care of the ecosystem to which it belongs.

With the first report, the concept of sustainable development was announced and brought to the public opinion as well as to the political leadership. The concern of the CoR regarding the evolution of the planet has remained over the last thirty years. Several other publications followed the first report covering the ‘problématique’ of poverty and hunger, North-South relationship, and world governance.

From the very beginning the CoR focused its attention on learning and education, and in 1979 the report was published *No Limits to Learning* which was reedited in 1998. In other CoR publications the problem of education as a contribution to the alleviation of poverty has been repeatedly mentioned. In this regard, the CoR feels that the education of the young, as well as a process of lifelong learning, and the continued search for knowledge are an essential ingredient in fostering a greater sense of responsibility among the citizens of both developing and industrialised countries.

The information society that is now rapidly developing creates unique opportunities and methods for eliciting a sense of vigilance and responsibility among individuals and communities. Reaching a sustainable world society implies the alleviation of poverty and reduction of the ‘digital divide’. The emerging information and knowledge societies do have the potential to provide mankind with appropriate technical, social and cultural solutions for a sustainable development in the coming half of the century. Statements of the CoR to the World Summit on Sustainable Development (WSSD) and to the World Summit on the Information Society (WSIS) underline the role of education and capacity building in the progress of poverty alleviation. The moment has come to bundle the expertise and forces of NGOs and civil society as well as of the business supported by governance and political leadership to tackle the ‘problématique’ of illiteracy, ‘digital divide’ and poverty to create a worldwide momentum for participation of all in the knowledge society of the future.



IFIP

## INTERNATIONAL FEDERATION FOR INFORMATION PROCESSING

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### *IFIP and its Role in the Information Society*

As early as 1959 when computers and their applications only began to influence the work of enterprises and universities, UNESCO organized the first international conference on computers and computing in Paris. At that event, UNESCO called for international cooperation in the related issues. In 1960, computer societies from 13 countries established IFIP, the International Federation for Information Processing, as “international, apolitical organization to encourage and to assist in the development, application and usage of Information Technology for the benefit of all people”. In its organization, IFIP follows the UNESCO’s pattern, with General Assembly as a supreme law-setting body.

Essential elements of IFIP mission are:

- to stimulate, encourage and participate in research, development and application of Information Technology (IT);
- to promote international cooperation;
- to pay special attention to the needs of developing countries and to assist them in appropriate ways to secure the optimum benefit from IT application;
- to promote professionalism incorporating high standards of ethics and conduct among all IT practitioners;
- to provide a forum to assess social consequences of IT applications;
- to campaign for safe, beneficial development and use of IT and to protect people against abuse through its improper application, and
- to contribute to formulation of education and training needed by IT practitioners, users and public at large.

IFIP’s main contributions in areas of Information and Communication technologies come from its 12 Technical Committees (TCs) with 78 Working Groups (WGs) dedicated to all aspects of ICTs:

TC-1	Foundations of Computer Science
TC-2	Software: Theory and Practice
TC-3	Education
TC-5	Computer Applications in Technology
TC-6	Communication Systems
TC-7	System Modeling and Optimization
TC-8	Information Systems
TC-9	Relationship between Computers and Society
TC-10	Computer Systems Technology



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TC-11	Security and Protection in Information Processing Systems
TC-12	Artificial Intelligence
TC-13	Human-Computer Interaction

In addition, a new Special Interest Group deals with Entertainment Computing.

For this Round Table discussion of "Education and Knowledge Societies", the work of TC-3 is of special importance. Its seven Working Groups deal with Informatics and ICT in Elementary, Secondary and Higher Education, IT-Professional and Vocational Education in Information Technology, Education Applications of Information Technologies, Distance Learning and IT in Educational Management. Besides many workshops and conferences on specific themes, the regular World Computer Congress in Education (WCCE) covers all aspects of Education and Informatics (next WCCE to be held in 2005 in Capetown/South Africa). For many years, TC-3 has strongly supported UNESCO's work in the related areas, and its experts have made essential contributions, including curricula for Informatics in schools. More recently, TC-3 has been very active in e-learning and distance learning, especially in developing countries.

IFIP's flagship event is World Computer Congress (WCC), where TCs and WGs regularly present new developments, insights and prospects in almost all areas of Information and Communication Technologies. The 18th WCC-2004 will be held in Toulouse, France. It is worthwhile to report that the last World Computer Congress (WCC-2002, Montreal, Canada) had a major contribution from UNESCO ADG Dr Khan, and a special session was devoted to discuss, in close cooperation with UNESCO, the interests, roles and requirements of young people related to the Information Society. Finally, the Congress accepted "UNESCO – IFIP Youth Declaration" to be considered in UNESCO work.

In pursuing its aims to support developing countries in their benefit from modern ICTs, IFIP has started as a new initiative to biannually organize "World IT-Forum" (WITFOR). At its 1st conference, cosponsored by UNESCO and organized by Lithuanian government, WITFOR-2003 held in August 2003 in Vilnius, Lithuania, over 750 participants discussed aspects of development in eight different commissions, including Preparing the Ground for ICT, Building the Infrastructure, Economic Opportunity, Empowerment and Participation, Health, Education, Environment, and Social and Ethical Aspects. Summarizing the results and suggestions of WITFOR-2003, "Vilnius Declaration" was discussed, unanimously adopted and sent to UNESCO for discussion at the World Summit. Its 2nd conference, WITFOR-2005, will be held again under IFIP and UNESCO sponsorship at the invitation of the government of Botswana, with a major focus on ICT development in Africa.



## INTERNATIONAL COUNCIL FOR OPEN AND DISTANCE EDUCATION (ICDE)

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<b>Memberships:</b>	ICDE is approved and authorized by the United Nations to serve as Global Membership Organization in Open Distance and E-learning

The International Council for Open and Distance Education (ICDE) is the global membership organization of educational institutions, national and regional associations, corporations, educational authorities and agencies in the fields of open learning, distance education, and flexible, lifelong learning.

We have members in 142 countries around the world, and represent through this membership the leading network of expertise and experience in distance education.

ICDE is:

- approved and authorized by the United Nations to serve as Global Membership Organization in Open Distance and E-learning;
- established in 1938: we have long experience, and have proved we can adapt to change and new circumstances;
- a non-profit organization. The ICDE mission is to deliver quality service to our members;
- a membership organization. It enables partnership approaches and networking, peer to peer;
- global in membership and outreach;
- experienced in working in different cultures and circumstances;
- independent.

Founded in 1938 to help provide education for students and children living far away from schools, the International Council for Open and Distance Education (ICDE) has become over the years the global membership organization in the field, and is now present in 142 countries. Its major membership is composed of educational institutions of all levels (schools, colleges, universities), including national and regional associations, corporations, educational authorities and agencies, active in open, virtual and distance learning.

The main mission of ICDE today is to provide leadership and facilitate cooperation, development and communication at the global level in distance and virtual learning.

ICDE's general and permanent missions are directed at the major issues the world of education is confronted with at the beginning of the 21st century, such as:

- global need for education and training at all levels;
- applications of information and communication technology (ICT) to education (especially the Internet) and their direct consequences of the general paradigm shift in education everywhere in the world;
- development of world education market and necessary regulations to achieve in terms of access and quality assurance.



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To deal with these issues, ICDE brings theoretical and practical expertise from the five continents.

Every year, ICDE gathers the institutional leadership in their institutional membership for a high level conference to set up an agenda for development and cooperation, as well as to share institutional practice and challenges. In the years ahead ICDE will be engaged in several main fields of action:

- To help narrow the digital divide in education and training;
- Through research and development to understand better how the Internet can be used to provide for high quality learning;
- To focus on quality and high standards of best practise;
- To work with governments, IGOs and the education sector to develop educational systems for the information society;
- To work with teachers and other professionals around the world to develop capacity and quality in technology-enhanced learning;
- To organise meetings and conferences around the world that focus on educational development and cooperation in the information society;
- To work with companies developing technology and software for education in order to help make their products better and more relevant. As an aside I would like to mention in this connection that at the moment we have a partnership with one of the company present here. This is EduTech International, and I hope that you will have a chance to visit our exhibition booth during the conference, where they demonstrate their portable web-casting and VOD systems;
- Finally it is an objective of the ICDE in the years ahead to promote multiculturalism and provide for virtual learning.

Founded before the Second World War, ICDE organised the only forum in the world where distance education institutions and professionals could meet in order to discuss important issues, learn from each other and enter into partnerships and business ventures. The ICDE world conferences rapidly became the place that everybody went to in order to meet colleagues from around the world.

Since 1995, the online, or virtual learning institutions have appeared in the membership of ICDE. It can be said, that during the last 10 years, ICDE and its members have gained international leadership in educational development.

While the first and second generations of Open and Distance Learning (ODL) did little to entrench and foster the development of research in any organised fashion, and at best used it to embellish the provision of distance learning, the currently emerging third generation of ODL cannot and should not push aside the research to its own detriment. As has been said in some circles, the future of ODL belongs to research.

ICDE will embrace research as a potent instrument for informing practice. For the future practice of ODL, research and engagement in it might be one of the most important characteristics, which will distinguish quality ODL institutions and products from the emerging, so-called online or virtual institutions, which have no roots in pedagogy and inquiry.

ODL is essentially about the best way to design and develop instructional packages, to communicate instruction, to interact with learners and provide support, to assess learning and to disseminate information in a knowledge-based society. The key to all these is definitely research.

The promotion of research and the harnessing of its potential for ICDE and its members' activities – professional, academic and logistic – are essential for the continued recognition of ODL worldwide.

ICDE's relationship as a UNESCO affiliated NGO goes back to the 1960s. Since then, ICDE has worked with UNESCO in numerous programmes and activities. Distance and virtual learning systems from less developed, as well as highly developed countries participate in ICDE.

ICDE publishes the international journal of distance education Open Praxis four times a year. Opening its pages to scholarly papers, it provides information on worldwide developments in the field of open learning and distance education, as well as a forum for communication of the members.

The outcome of ICDE activities becomes evident during the World Conferences. Practically every two years since 1938, ICDE has been organising World Conferences on Open and Distance Education. The conferences are major events, and offer a large



variety of presentations on the issues related to open and distance education in all parts of the world. The latest ICDE World Conference took place in Düsseldorf, Germany in April 2001. The next one will be held in Hong-Kong, China in February 2004 and is planned to provide a major contribution to the World Summit on the Information Society (Geneva, December 2003).

ICDE has developed regional activities as well. Thus, regional conferences are regularly organised in the time period between the biennial World Conferences. In the year 2000, for instance, three conferences were held in Brazil for Latin America and the Caribbean, in India for South Asia, and in Australia for the Pacific region, respectively. Now we are meeting at the regional conference for North America.

General Headquarters of ICDE is in Oslo, Norway. Several local offices are active in various parts of the world.

### ***International Recognition***

ICDE is officially recognised by the United Nations as a global non-governmental organization responsible for the field of open and distance learning, and is affiliated with the United Nations through UNESCO. ICDE is also an affiliate member of Southeast Asian Ministers of Education Organization (SEAMEO) and a World Bank Partner organization.





## INTERNATIONAL ASSOCIATION OF UNIVERSITIES (IAU)

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The International Association of Universities (IAU) is a UNESCO-based, international non-governmental organization founded in 1950. It brings together universities, higher education institutions and organizations from 150 countries for debate, reflection and action on common concerns. IAU collaborates and works in partnership with various international, regional and national bodies. As a cooperative and service-oriented organization, IAU aims to promote international networking among universities, to facilitate the exchange of information, experience and ideas, as well as the mobility of students and staff, and to contribute, through meetings and research to informed higher education policy debate.

Membership in the Association is granted to individual institutions or organizations by the Administrative Board. IAU members are represented in the supreme organ of the Association, the General Conference, which elects the President and the Administrative Board. The Administrative Board is made up of Board and Deputy Board Members, all outstanding higher education leaders from each region of the world.

IAU represents nearly 700 institutions and university organizations.

Highly concerned by all topics related to higher education, IAU focuses specifically on the following thematic priorities:

- Sustainable Development
- Internationalisation
- Globalisation
- Intercultural Dialogue
- Information Technologies

Working Groups have been set up for each thematic priority.

In 1949 UNESCO established Documentation Centre on higher education as a part of the International Universities Bureau (IUB), which preceded the founding of IAU. A formal agreement signed between UNESCO and IAU in 1989 established the joint IAU/UNESCO Information Centre on Higher Education with a more focused and specialized mandate.

The Centre has a role within the network of UNESCO Documentation Centres and Information Units and a responsibility to provide higher education information to universities and to the general public. Through the use of information and communication technologies, it serves the needs of a wide public, including IAU member institutions, governmental and non-governmental agencies and bodies, both national and international, researchers and specialists in higher education, university professors, administrators, international relations officers, education and career counsellors, students and employers.



The IAU/UNESCO Information Centre on Higher Education collects, reviews and updates information on higher education systems, policies, institutions, programmes of study and qualifications. It also houses data on issues related to staff development, higher education research, and recognition of studies, international cooperation and student mobility.

IAU and its Information Centre regularly publish the following publications:

- IAU Newsletter (accessible on the World Wide Web)
- International Handbook of Universities (biennial)
- World List of Universities and Other Institutions of Higher Education (biennial)
- World Higher Education Database CD-ROM (annual)
- Guide to Higher Education in Africa (biennial)

IAU also publishes the scholarly Journal "Higher Education Policy" (quarterly) and monograph series "Issues in Higher Education".



## UNIVERSITY OF MAURITIUS VIRTUAL CENTRE FOR INNOVATIVE LEARNING TECHNOLOGIES (VCILT) AND LIFELONG LEARNING CLUSTER (LLC)

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### *Main goals of VCILT*

- Promote innovative teaching and learning practices through the use of distance and flexible learning technologies.
- Promote non-formal approaches to lifelong learning.
- Experiment with new educational delivery systems.
- Establish a partnership with the academic staff to help them meet teaching and learning requirements, which attains user satisfaction.
- Be forward looking and thus supporting a leadership role in the development of telelearning.

### *Main Areas of Activities*

VCILT has been responsible for providing and developing online Web-based education and telelearning at the University and throughout the country. VCILT offers access to multimedia workstations, printed reference materials, technical support and other facilities. Through its Virtual Campus (<http://vcampus.uom.ac.mu>) VCILT supports academic and tutors with technology, pedagogical and management tools for the concept elaboration, multimedia presentation and networking of their contents and activities.

### *Activities in the Field of Education:*

#### – Development/Delivery of Online/Web-Enhanced Modules for the University

Currently 23 modules are being delivered as Web-enhanced/Online modules. Recently, this line of development has considerably increased at the centre.

#### – Computer Proficiency Project

In line with the Government vision of making Mauritius a cyber-island, Computer Proficiency Project (CPP) was set up to deliver a mass training course on IT Proficiency. In this respect, VCILT developed a CD-ROM and a study guide. By now approximately 5,000 trainees (including teachers of primary and secondary schools and civil servants) have been trained through CPP. The contents of the IT Proficiency modules developed, VCILT has contributed in the training of trainers. Two hundred trainers have been prepared so far at the University of Mauritius. CPP has become

#### – CPP-Test Centre

CPP addressed VCILT to develop a system of multiple-choice questions to enable the participants who have already accomplished the IT proficiency programme to obtain a certificate in Computer Proficiency.

#### – MRC Teaching Science/History

This project is an initiative of the Ministry of Education to develop Multimedia Educational Materials for primary school students. In this respect, VCILT submitted two proposals on History and Sciences; as a result we were given an approval to work on the project "History and Geography through ICT across the Curriculum at Primary Level".



– **iLearn Virtual Campus platform**

Since October 2002 a Virtual Campus platform has been under development at VCILT. The platform is based on the customisation of the Ganesha open source platform. The iLearn, achieved, the University will be provided with full autonomy in the delivery of Online/Web-enhanced modules.

– **School IT Project**

The Government of Mauritius launched a tender on School IT in order to enable the effective use of Information Technology as a supporting tool in the education sector. In that respect, VCILT bid on RFP on Educational Software for School Laboratories on seven packages namely Basic Computer Skills, Word processor and a simple drawing package, Logo, Mathematics, Sciences, Multimedia Authoring-Web Authoring-Movie Editor, Role Playing Games/Discovery Games.

– **ICOOL 2003, an International Conference on Open and Online Learning**, organized under UNESCO's sponsorship from 7 to 13 December 2003 by the Virtual Centre for Innovative Learning Technologies of the University of Mauritius in collaboration with the University of Reunion.

In line with UNESCO ongoing efforts to bridge the gap between information rich and poor countries and thus contribute to social changes and improvements, ICOOL 2003 will focus on "Community Development & Networking for Capacity Building". The Conference will serve as a multi-disciplinary forum for discussion and reflection on activities and projects related to all aspects of technology-enhanced learning, with a particular emphasis on the quality and availability of education.

The scope of the conference includes the following major topics as they relate to methodologies grounding the relationship between education and technology to allow for action:

1. Pedagogies & Communication
2. Technologies
3. Innovation & Social Impact
4. Quality Assurance, Evaluation & Certification

ICOOL 2003 participants are experts from Botswana, Canada, Czech Republic, Denmark, Finland, France, Germany, India, Malaysia, Mauritius, Netherlands, New Zealand, Nigeria, Pakistan, Reunion, South Africa, Switzerland, Taiwan, United Kingdom and USA, and such organizations as Commonwealth of Learning or major private companies.





## **FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)**

**Status:** UN Agency established in 1945  
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00100 Rome, Italy  
**Phone:** +39 06 57051  
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The Food and Agriculture Organization of the United Nations was founded in 1945 with a mandate to raise levels of nutrition and standards of living, to improve agricultural productivity, and to better the condition of rural populations.

Today, FAO is one of the largest specialized agencies in the United Nations system and the lead agency for agriculture, forestry, fisheries and rural development. An intergovernmental organization, FAO has 183 member countries plus one member organization, the European Community.

Since its inception, FAO has worked to alleviate poverty and hunger by promoting agricultural development, improved nutrition and the pursuit of food security – defined as the access of all people at all times to the food they need for an active and healthy life.

Food production has increased at an unprecedented rate since FAO was founded in 1945, outpacing the doubling of the world's population over the same period. Since the early 1960s, the proportion of hungry people in the developing world has been reduced from more than 50 percent to less than 20 percent. Despite these gains, however, more than 790 million people in the developing world – more than the total population of North America and Western Europe combined – still go hungry.

A specific priority of the Organization is encouraging sustainable agriculture and rural development, a long-term strategy for increasing food production and food security while conserving and managing natural resources. The aim is to meet the needs of both present and future generations by promoting development that does not degrade the environment and is technically appropriate, economically viable and socially acceptable.

In 1989, FAO established the **World Agricultural Information Centre (WAICENT)** for agricultural information management and dissemination. In 1996, WAICENT became available on the Internet. Today, it is FAO's online portal, giving immediate and free access to essential documents, statistics, maps and multimedia resources.

**The WAICENT Portal** offers a search tool for locating information on the FAO web site. It provides the main access points to the enormous accumulated collections of FAO technical information online, on subjects such as food security, agriculture, fisheries, forestry, biodiversity, desertification, commodities and trade, and nutrition and food safety.

**The FAO Virtual Library** is a digital information centre that uses an advanced search engine to provide access to FAO's archives online. This makes it possible to support the work of FAO in all areas and to build a network of Virtual Libraries in member countries, such as the one set up in cooperation with the Ministry of Agriculture in Spain.



**The Virtual Library Electronic Publishing System** — with its series of templates available in five languages — has contributed to making more FAO documents available in more languages and in a more efficient way. Production time has been greatly accelerated through the digital technology that powers the Electronic Publishing System.

As part of an overall strategy to improve food security and better the lives of rural people around the world, FAO is helping its member countries strengthen their capacity to access and exchange digital information, including the information available through WAICENT. Improving the use of information to mitigate the impact of natural disasters is one of the key areas in which WAICENT is playing a role.

Young people can use the International Classroom link found on WAICENT's home page, in the FAO Subject Directory "Education and extension".

WAICENT provides the platform for managing and disseminating the wealth of information available from FAO and putting it at the fingertips of those who need it. One of the priorities of WAICENT is to establish and foster international partnerships.



## NGO-UNESCO LIAISON COMMITTEE

Status: Non-profit organization  
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Fax: + 33 1 45 66 03 37  
E-mail: [comite.liaison.ong@unesco.org](mailto:comite.liaison.ong@unesco.org)  
Web site: [www.unesco.org/ngo/comite/](http://www.unesco.org/ngo/comite/)

Thousands of NGOs have contacts with UNESCO, but only about 350 large international NGOs are in official relation with UNESCO. They are chosen for:

- a) their geographical representativeness;
- b) their quality of cooperation;
- c) their democratic legitimacy.

The NGOs maintaining official relations with UNESCO (a list of them could be found at <http://erc.unesco.org/ong/en/directory/ListeONG.asp>) are represented at UNESCO by a Liaison Committee of 10 members.

The NGO-UNESCO Liaison Committee has the mandate to:

- represent the interests of UNESCO centered NGOs with regard to UNESCO;
- cooperate with the Director-General of UNESCO;
- implement the resolutions adopted by the International Conference of NGOs;
- ensure appropriate exchange of information and make preparations for subsequent sessions of the international conference of NGOs;
- ensure that the interests and opinions of NGOs taken collectively are reflected by UNESCO.

The major activities of the Committee consist in:

- organizing the International Conference of NGOs every 3 years;
- taking part in the joint programme committees set up by UNESCO;
- taking part in collective consultations on the main issues treated by UNESCO;
- taking part in regional consultations;
- setting up commissions and organizing special events.



# **Towards Societies**

Geneva, Switzerland  
10-12 December 2003

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UNESCO at the  
World Summit on the Information Society (WSIS)

## Towards Knowledge Societies

Geneva, Switzerland  
10-12 December 2003

The World Summit on the Information Society (WSIS) is held in two phases under the high patronage of Kofi Annan, UN Secretary-General, with the International Telecommunication Union taking the leading role and in cooperation with other interested UN agencies.

### Geneva 2003: First Phase

The first phase of the World Summit in Geneva will be hosted by the Government of Switzerland from 10 to 12 December 2003. It will address a broad range of themes concerning the Information Society and adopt Declaration of Principles and Plan of Action, addressing the issues related to the Information Society.

### Tunis 2005: Second Phase

The second phase of the World Summit in Tunis will be hosted by the Government of Tunisia from 16 to 18 November 2005. Development themes will be a key focus of this phase, which will assess the progress made and adopt a further plan of action.

The UNESCO Institute for Information Technologies in Education (IITE) in charge of the Round Table discussion "Education and Knowledge Societies" on 11 December 2003 in Geneva, invites the participants of the event as well as those interested in the development of education for and in knowledge societies to join the informal community and contribute to the follow-up of the first WSIS phase.

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