



**Tapio Varis
Salem Al-Agtash (Eds.)**

UBIQUITOUS ICT FOR SUSTAINABLE EDUCATION AND CULTURAL LITERACY

PUBLICATIONS OF THE FINNISH NATIONAL COMMISSION FOR UNESCO NO. 84



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SUMMARY REPORT:
UBIQUITOUS ICT FOR SUSTAINABLE EDUCATION AND
CULTURAL LITERACY

Workshop Hämeenlinna, 6–7 October 2008

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EXECUTIVE SUMMARY

Salem Al-Agtash and Tapio Varis

Similar efforts exist around the world, which also aim at advancing education for better literacy. This workshop is intended as a contribution to bring together scientists, public authorities, businesses, academics, civil society organizations and other interested groups and stakeholders to understand challenges for sustainable education and cultural literacy in the global context; identify the potential of ICT to advance and improve education; share knowledge and best practices about successful policies in global education; create venues of collaboration; and consolidate responsible communities for multi-literacies.

The SECL workshop is a continuing effort of academics representing consortium institutions from Finland, Germany, Sweden, and Jordan and other countries collaborating on an EU Tempus funded project. The main objective of the project is to advance the frontiers of knowledge in ICT education as a core driver for Jordan national prosperity. The academics envision a collaborative atmosphere among Jordan and EU institutions for advanced teaching, applied research, staff/student exchange, and development for better quality of ICT education and relevance knowledge in a socio-economic development context.

The contributions also reflect the activities of the UNESCO Chair in Global e-Learning of building Global University System (GUS). The report is a product of a series of collected efforts from academic research expertise put together with international leaders to better understand challenges in an era of global education and cultural dialogue. The report provides findings and thoughts that could assist in enhancing mutual understanding among nations, and in building communities that will collectively lead to sustainable education in the global context. Our findings may be used to guide the efforts of governments and policies leading to a future success for better cultural understanding.

MESSAGES AND STATEMENTS



**MESSAGE FROM THE PRESIDENT OF THE REPUBLIC OF
FINLAND TO THE INTERNATIONAL WORKSHOP ON UBIQUITOUS
ICT FOR SUSTAINABLE EDUCATION AND CULTURAL LITERACY
IN HÄMEENLINNA, 6–7 OCTOBER 2008**

This international workshop is an excellent example of the way to bring a range of professionals to share knowledge and experience in order to promote ICT technologies for education and, more widely, for sustainable social development.

Globalization means that information, new ideas and innovation are spreading faster than ever. ICTs can provide effective means for developing countries to accelerate their progress and enable better learning opportunities. For developed countries, the knowledge-based economy – if socially just and inclusive – allows further specialization and improved skills.

In Finland, education and lifelong learning have been given special importance. Education and training boost one's capacity for self-determination and for making life choices. They also give people opportunities to use their expertise and their talents in the best possible way to benefit themselves, their families and society as a whole.

I wish the workshop the best of success and hope that you have fruitful and lively discussions.

A handwritten signature in cursive script that reads "Tarja Halonen".

Tarja Halonen
President of the Republic of Finland

MINISTRY OF EDUCATION

GLOBAL EDUCATION – FINNISH PERSPECTIVES

Ritva-Sini Merilampi

Councillor for Education, Ministry of Education, Finland

Sustainable tomorrow will be true if only we understand that the future is not a force of nature – a flood or an earthquake. It does not just happen, we make it through our own choices. One of the choices in Finland is an implementation of Global Education 2010 Programme.

The Programme for Global Education outlines the development of global education in Finland and defines the term ‘global education’. Altogether seven national objectives are set for global education:

- including global education in the foremost educational, cultural and social policy lines
- expanding global education in formal education
- supporting research and higher education relating to global education
- supporting international activities of civic organizations
- building up partnerships between the public administration, businesses, the media and civil society
- increasing resources needed for this
- monitoring systematically and evaluating analytically the success of global education.

Citizenship is membership in a civilised community working on shared norms and commonly agreed principles. World citizenship in turn is commitment to building a world order which offers a real opportunity to fully realise all the dimension of humanity, irrespective of state borders and cultural boundaries. It is on these conceptions of citizenship and world citizenship that the Programme – launched in 2007 by the Finnish Ministry of Education – rests.

MEDIA EDUCATION AND MEDIA LITERACY IN A DIGITAL WORLD

As one necessary action, the Global Education 2010 programme suggests encouraging the traditional and new media to produce materials which present the world in a diverse and responsible way and which are informed by the values of global education.

The Programme further proposes that a global education standpoint be included in all professional education in the media field and in general media education, in which children, young people and adults learn media use and critical reception, understanding and interpretation of content.

In today's electronic information environment, everyone is able to access vast amounts of data without an intermediary. This, if anything, requires critical thinking.

Critical thinking means a way out of confusion towards comprehension. Critical thinking is a productive and positive activity. Critical thinkers are aware of the diversity of values, behaviours, social structures and artistic forms in the world. Critical thinking is emotive as well as rational. Critical thinkers try to imagine and explore alternatives – and move from moral panic to creative thinking.

With the changes in the media landscape, the concept of literacy is expanding towards what is currently known as media literacy. Traditional literacy is no longer enough, one should also be able to communicate by means of different media, be they verbal, visual, oral, auditive, digital, iconographic or any combinations of these.

The new concept of literacy highlights the social nature of reading and writing. The new literacy relates to socio-cultural frames of reference and to competencies required in the midst of cultural change.

Finland is known for having nearly 100-per-cent literacy. We also want to keep up in media literacy. Media literacy empowers people in all walks of life to seek, evaluate, use and create information effectively in order to reach their personal, social, occupational and educational goals. It promotes social inclusion in all nations.

What global education is ultimately about is creating a relationship between the self and the world!

RECTOR'S MESSAGE

UNIVERSITY OF TAMPERE

Krista Varantola,

Rector, University of Tampere, Finland

The activities of the UNESCO Chair in Global e-Learning began immediately after the signature of the Agreement between UNESCO and the University of Tampere at the end of 2001 and has applications to multiple domains at the University of Tampere. The Chair was created at the Research Centre for Vocational Education at the Faculty of Education, where the Chair of Media Education had been established with co-operation with the Hypermedia Laboratory. The Chair was created to promote co-operation with other centres of excellence, especially with the Open University in the U.K. and the Open University in Catalunya in Spain. The purpose of the Chair was clearly articulated in the Agreement:

“The purpose of the Chair shall be to promote an integrated system of research, training, information and documentation in the field of global e-learning with applications to multiple domains. It will serve as a means of facilitating collaboration between high level, internationally recognized researchers and teaching staff of the University and other institutions in Finland and Europe and other regions in the world.”

In 2002 the University of Tampere appointed Dr. Tapio Varis, Professor and Chair of Media Education, as the first Chair-holder and he has been in charge of the Chair since. In 2003 the researchers of the Chair network produced a book on *Global Peace through the Global University System* as the first major contribution of the Tampere Chair to the international UNESCO network and academic community of these goals and specific applications. The “International Workshop on Ubiquitous ICT for Sustainable Education and Cultural Literacy”, held in Hämeenlinna 6-7 October 2008, is a continuation of this work. It also links the participation of the University of Tampere in the EU TEMPUS project with German-Jordanian University in Amman to these goals. Furthermore, the Research Centre for Vocational Education of the University of Tampere is also the national UNESCO-UNEVOC centre for vocational educations which contributes to the global network of UNEVOC centres.

The University of Tampere follows the spirit of Mr. Koichiro Matsuura, Director-General of UNESCO, who emphasized on the 13th November 2002, in the World Forum of UNESCO Chairs the need is to make educational materials freely available on the Web and to have the real possibilities to do so. In the UN First Alliance of Civilizations Forum in Madrid in December 2007, Mr Matsuura emphasized that the UNESCO Chair Network is an excellent world-wide network for the implementation of the ideals of AoC. According to the UNESCO philosophy “It is necessary to build up large movement to humanize globalization, based on solidarity, on the spirit of caring for and sharing with others”. For this purpose the Open Educational Resources (OER) initiative functions as a cooperation mechanism for the open, non-commercial use of educational resources.

We are proud to say that the President of Finland, Mme Tarja Halonen, is among the strong supporters of the AoC initiative. Her message in this publication prepared to the Hämeenlinna workshop reflects the strong commitment and encouragement given to our educational efforts in the highest level. The University of Tampere shares these values and spirit of global solidarity in the fields of education, science, culture and communication.

PRESIDENT'S STATEMENT

GERMAN-JORDANIAN UNIVERSITY

Labib Khadra

President, German-Jordanian University – Amman, Jordan

The workshop comes as a response to the cultural and development constraints in meeting challenges of the changing global environment and as a means to identify ways in which to narrow the social divide by highlighting “sustainable education” as a drive for change and “Cultural literacy” to bring more tolerance, understanding and open dialogue between different ethnics, religious and social identities. It is time to create dialogue between scientists to facilitate and sustain successful models of interuniversity cooperation and collaboration networks with leaders from industry, academia and civil society.

The German-Jordanian University represents such a model not only for education and research but also for the incubation of a multicultural society whereby, international and multinational cultural relations, tolerance, dialogue, rapprochement and mutual understating are fostered in an environment of open-mindedness, respected of others opinions and appreciation of their differences.

With closer ties with over 60 German partner universities, enhanced partnerships with national and international enterprises, one full year study abroad student program, and staff exchanges, the university has positioned itself as a leader in offering nontraditional programs with strong theoretical and practical orientation focusing on regional needs for industrialization and technology advancement.

With my support to your continuing efforts, I remain, on developing capabilities, adopting values of global social responsibility, engaging in conceptual and empirical research to advance new values, and facilitating a dialogue among educators, business, policy makers, and organizations on critical global social responsibility issues.

STATEMENT BY TALAL ABU-GHAZALEH **UN GLOBAL ALLIANCE ON ICT AND DEVELOPMENT**

Talal Abu-Ghazaleh

Vice Chair of the United Nations Global Alliance on ICT and Development; and Founder and chairman of Talal Abu-Ghazaleh Organization – www.tagorg.com

FIRST,

Allow me to address the global context of culture and education from my business prospective, as a leading group of professional service providers (including consultancy) in Asia and Africa.

What is needed is a driver in developing sustainable projects involving educational institutions, government, investors and other stakeholders, bringing together all the ICT-based needed resources for enhancing the global context of education and culture.

Around the world, about 800,000 cities and villages and around one billion people still lack connection to any kind of ICT, and have remained locked out of the digital revolution with no access to information, communication, education, and commercial resources available on the Internet. What we need are business initiatives rather than assistance policies and advice, and ICT-based implementations for enhanced connectivity in poor areas, increased economic competitiveness, and a powerful ground for leaders and responsible bodies to accelerate the diffusion of ICT across communities and nations making possible a better future for our next generation.

I urge you to consider establishing an educational fund, for the purpose of investing in ICT facilities in countries that need it and building educational capacity and capability for sustainment, by working in cooperation with governments, institutions, and international organizations in order to promote long-life learning; enhance cultural exchanges; increase economic growth and political stability; and foster global business and IT in the context of the changing global environment, human rights and with reduced disparity.

Governments, higher education institutions, and other UN agencies can act as catalyst, knowledge bank and oversight agencies for such local and regional business led enterprises.

SECOND,

We need to:

- Help implement on ground ICT enabled environment (infrastructure, skill development, and content) in poor areas.
- Invest into sustainable interuniversity cooperation to enhance a global context of education.
- Contribute to a theme “for better business” that addresses not only wealth creation in business enterprises but also the concepts of globalization, environment, societal responsibility and sustainability.

THIRD,

Talal Abu-Ghazaleh Organization through Talal Abu-Ghazaleh College of Business at the German-Jordanian University is committed to work closely with universities, governments, business, and other stakeholders, within the 22 Arab Countries and in between them, such that TAGorg will through its offices in all these countries bring together thre right mix of partners suitable for implementing ICT enabled environment and setting up capacity building programs in each country.

FOURTH,

The following key issues need to be explored:

1. How can rural access and connectivity contribute to national economic development?
2. How can training and capacity building support education and poverty reduction?
3. How can rich local contained development overcome the barriers to information, knowledge development and dissemination, relevant to local needs and conditions?

**MESSAGE FROM THE DIRECTOR OF THE UNESCO-UNEVOC
INTERNATIONAL CENTRE FOR TECHNICAL AND VOCATIONAL
EDUCATION AND TRAINING (UNESCO-UNEVOC) TO THE
INTERNATIONAL WORKSHOP ON UBIQUITOUS ICT FOR
SUSTAINABLE EDUCATION AND CULTURAL LITERACY IN
HÄMEENLINNA, 6-7 OCTOBER 2008**

Rupert Maclean

Director, UNESCO-UNEVOC International Centre

Information and communication technologies (ICTs) have an ever-increasing relevance in education and training around the world. ICTs can, for example, provide more widespread access to education and training, support innovative teaching and learning modalities, and even increase quality. ICTs also have a broader impact on societies and cultures. Through the development of the Internet, for example, the world has become a much smaller place, and instantaneous access (and contribution!) to knowledge, as well as easier communication and collaboration between people from around the world has become possible.

The International Workshop on Ubiquitous ICT for Sustainable Education and Cultural Literacy (SECL 2008) will address many crucial issues related to ICTs and education and will investigate their broader impact on today's globalised world. The UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training (TVET) is proud to be a partner in the organisation of this important event.

The UNESCO-UNEVOC International Centre assists UNESCO's 193 Member States strengthen and upgrade their TVET systems in the context of the overarching UNESCO goals in TVET, namely to assist Member States improve and integrate TVET as part of the global Education for All Campaign, and to assist the alignment of TVET with the tenets of sustainable development. Through its work, the Centre supports the integration of ICTs into TVET around the world, and it stresses many of the issues that will be addressed at the SECL workshop, including the significance of collaboration, dialogue and networking, the importance of public awareness on the challenges and opportunities of ICTs, and the value of sharing knowledge and good practice.

The UNESCO-UNEVOC International Centre is the hub of a worldwide network of specialised TVET institutions, the UNEVOC Network, which consists of more than 280

organizations – the so-called UNEVOC Centres – in 166 UNESCO Member States. The Network is a unique international framework and platform for interaction and collaboration among TVET practitioners from UNEVOC Centres in developed and developing countries, countries in transition and those in a post-conflict situation. The Network fosters and facilitates learning and the sharing of knowledge in TVET, including ICTs in TVET, as well as the formation of mutually beneficial partnerships.

The University of Tampere's Research Centre for Vocational Education is one of two UNEVOC Centres in Finland. Its initiatives to be a lead UNEVOC Centre on integrating sustainability issues into TVET and developing TVET in South Eastern Europe in conjunction with the UNEVOC Centre in Saint Petersburg, Russia, hold great promise for joint projects. The Research Centre for Vocational Education at the University of Tampere is an important contributor to the Network and a partner which UNESCO-UNEVOC greatly cherishes. Especially in developing opportunities and mechanisms that both support and promote partnership endeavours between UNEVOC Centres in the North and UNEVOC Centres in the South to facilitate the capacity-building and networking process, it is making a substantial contribution.

SECL 2008 provides an important opportunity to investigate many of the issues that are at the core of UNESCO-UNEVOC's work. I wish you a successful workshop and hope that your discussions will be productive and inspiring.

A EUROPEAN APPROACH TO MEDIA LITERACY

Matteo Zacchetti

European Commission, DG Information Society and Media,
Unit “MEDIA Programme and media literacy”

*“We become what we behold. We shape our tools and then our tools shape us”,
Marshall McLuhan*

*“Big brother isn’t watching. He’s singing and dancing. He’s pulling rabbits out of
a hat. Big brother is busy holding your attention every moment you are awake”,
Chuck Palahniuk*

Some 50 years ago, 6 European countries (Belgium, France, West Germany, Italy, Luxembourg and the Netherlands) signed the Treaty of Rome¹ creating the European Economic Community. The idea was for people, goods and services to circulate freely across borders. But the real concern was bringing together the nations and people of Europe. We should never forget that the historical roots of the European Union lie in an overwhelming tragedy: the 2nd World War. Europeans decided they would do anything to prevent such killing and destruction from ever happening again. Now the European Union embraces 27 countries from Portugal in the very west of the continent to the new Member States, Romania and Bulgaria, from the polar circle to the coasts of the Mediterranean Sea. Europe has almost half a billion citizens with many different languages, cultures and traditions but also with deeply shared values of democracy, freedom and social justice. Europe is against any discrimination based on ethnic origin, sex and philosophical belief. In its relations with international partners, the EU projects the values that have contributed to its own success. The prosperity of the EU has grown out of a particular form of regional cooperation, which has developed hand in hand with a deeper political commitment to democracy, human rights and the enhancement of citizenship. Today, we are witnessing an unprecedented technological revolution. The meaning of “wealth” has shifted towards ownership of knowledge and information. Technological change makes it possible for virtually all people to become not only consumers but also creators of media content. The media have become an

¹ <http://www.treatyofrome.com/treaty.htm>

increasingly powerful economic and social force and are accessible instruments for European citizens to better understand the societies in which they live and participate in the democratic life of their community. In this context, at the Lisbon European Council² in March 2000, Heads of State and of Government set an ambitious objective for Europe: to become a more competitive knowledge economy and at the same time a more inclusive knowledge society. A higher degree of media literacy would definitely help our societies to fulfil this ambitious objective.

Media literacy may be defined as the ability to access the media, to understand and critically evaluate media contents and different aspects of the media and to create communications in a variety of contexts. This definition is the result of the work of many different people (institutions, media professionals, teachers, educators) and it is built on three main elements: 1) access to media and media content; 2) critical approach, ability to decipher media messages, awareness of how the media work; 3) creativity, communication and production skills. Media literacy relates to all media, including television and film, radio and recorded music, print media, the Internet and other new digital communication technologies. Media literacy is an extremely important factor for active citizenship in today's information society, a real key pre-requisite just as literacy was at the beginning of the twentieth century. It is a fundamental skill not only for the young generation but also for adults (elderly people, parents, teachers and media professionals). As a result of the evolution of media technologies and the presence of the Internet as a distribution channel, an increasing number of Europeans can now create and disseminate images, information and contents. In this context, media literacy is viewed as one of the major tools in the development of citizens' responsibilities. Media literacy relates to European audiovisual heritage and cultural identity. The audiovisual production sector is an essential instrument of expression of our cultural and political values. It is a vector for European citizenship and culture and plays a primary role in building a European identity. Media-literate people will be able to exercise more informed choices also with regard to the audiovisual content market. Citizens would therefore have a higher degree of freedom as they will have the instruments to choose what they want to see and will be able to better evaluate the implications of their choices. Finally, media-literate people will be better able to protect themselves and their families from harmful, offensive or undesired content. Media literacy refers also to the skills, knowledge and understanding to enable citizens to use media effectively. It should empower them through critical thinking and creative problem-solving skills to make them informed consumers and producers of information.

² http://www.europarl.europa.eu/summits/lis1_en.htm

The Commission has adopted a communication on media literacy (A European approach to media literacy in the digital environment) at the end of 2007. The Commission's initiative on media literacy responds to requests by the European Parliament and industry together with a number of Member States. Work started in 2006 with the creation of a "Media Literacy Expert Group" with an advisory role for the European Commission. A public consultation was held at the end of last year which showed differences in practices and levels of media literacy in Europe. The Communication stresses the importance of media in today's rapidly evolving information society and in citizens' daily life and it adds a further building block to European audiovisual policy. The Communication links to the provisions of the AVMS Directive (article 26 introduced a reporting obligation for the Commission on levels of media literacy in all Member States) and the MEDIA 2007 programme which underlines the importance of media literacy and image education initiatives and in particular those organised by festivals for a young public. The Communication provides a European definition of media literacy (Media literacy is generally defined as the ability to access the media, to understand and to critically evaluate different aspects of the media and media contents and to create communications in a variety of contexts), which refers to all media and focuses on three main areas: media literacy for commercial communication, media literacy for audiovisual works and media literacy for online. By means of this policy document, the Commission intends to promote the development and exchange of good practices on media literacy in the digital environment through existing programmes and initiatives and to encourage research into criteria for assessing media literacy. The Commission also calls on Member States to encourage the authorities in charge of audiovisual and electronic communication regulation to get more involved and to cooperate in the improvement of the various levels of media literacy and to develop and implement codes of conduct and co-regulatory frameworks in conjunction with all interested parties at national level.

GLOBALIZATION AND THE DIALOGUE OF CIVILIZATIONS

A SUMMARY OF THE INTERVENTION

Professor Marco Antonio Rodrigues Dias

Representative of the United Nations in UNESCO, and President of ORUS –
International Observatory of University Reforms

In her opening message sent to this International Workshop, the President of Finland said that “Globalisation means that information, new ideas and innovation are spreading faster than ever. ICTs can provide effective means for developing countries to accelerate their progress and enable better learning opportunities. For developed countries, the knowledge-based economy – if socially just and inclusive – allows further specialisation and improved skills”.

The President of Finland is right and our Finnish colleagues should be proud with this message and with the fact that Finland is an example and a model of how a country, paying attention to the needs of its society, is able to enable better learning opportunities, which is a condition to participate in an efficient and inclusive way in the knowledge society.

However, concerning developing countries, we must pay attention to how globalization is being implemented in the world and we cannot ignore the financial crisis which has exploded these days, starting in the United States, a country whose debt presently reaches more than 9.500 billion dollars and is being transferred to the whole world. The crisis confirms that USA for a long time has spent more than it produces. In the last two decades, the US economy specialized in the production of debts mostly (household, corporate and public ones), knowing that an increasing share of this collective debt has been sold to foreign investors who now realize that they might never see some part of their loans back.

A tremendous effort is being made to save the financial system. Those who transformed the market for the good of present times are not able to recognize that the famous Consensus of Washington was a mistake and what is really needed is a completely different system based in different values. There is a need for initiatives to implement commitments made in favour of developing countries, related to such areas as agricultural subsidies, anti-dumping duties, tariffs peaks directed at products exported by developing countries, the absence of meaningful commitments on the movements of natural persons, the slow removal of quotas on textiles and clothing

and the promotion of technology transfer. There is also a need of cooperation based on solidarity to improve the transfer of knowledge.

All these points show why it is important to observe what is happening in the world, particularly in China, where figures are really impressive. China has a population of almost 1.4 billion people in July 2008, and was having 518 billion dollars in US government Treasury bonus. The Chinese authorities set up in September 2007 a special public investment fund and allocated to it the amount of 300 billion dollars. This allows China to make investments in all major Stock Exchanges in the world, save American banks in difficulties and buy powerful Western enterprises. In 2003, the number of rural migrant workers reached 114 million. In 2001, the rate of urbanization was 37 per cent. It is expected to reach 50% in 2030 and 70% in 2050. China is now the biggest importing country of cement (55% of world production), coal (40%), steel (25%), nickel (25%), and aluminum (14%). In 2006, it was the leading importer of oil. **Experts consider that at present one third of the world's economic increase is due to Chinese growth.**

In the world, particularly in Europe and Latin America, part-time jobs, contracts for defined period or provisional contracts, unpaid or poorly paid internships with a tendency to be renewed have multiplied. All these job modalities put together lead to contingency and vulnerability. In China, new rules aim at the protection of salaried workers and, instead of flexibility and contingency, job stability is searched for.

The result of all this is provoking changes in the control of the international economic system and, although a military war will probably not take place, an economic war is not unlikely, and it is possibly already taking place. But will it happen now with the collapse of the United States financial system? With the adopted measures – a new version of the principle of individualizing profits and collectivizing loss – will this system prevent its final collapse; will the present facts provoke the end of the US empire, or will this be one more crisis that will not last too long, with developments following the same path in the future?

For reaching a new and more fair model of globalization, the universal access to knowledge is essential. However, many developing countries have not established a strategy to improve the access to knowledge and have become “imitators” or buyers of science and technology. Chinese are aware that learning, knowledge and information have become the pilots of world society and that in the economic sector there is a fundamental difference today between those who conceive the industrial products and their production. Higher education is essential in this framework and, in China, it presents two striking characteristics: qualitative enhancement and quantitative growth. In 1990, there were 3.729.000 university students. In 2007, they were al-

ready 23 million students. Over the past two decades, China sent out nearly 270.000 people to 103 countries for advanced studies.

We should have all these elements in mind, see what China is doing, and observe that a new leadership is being consolidated in the world. We hope that this will happen in a context in which this will not imply for developing countries the substitution of masters but to provoke an occasion for a full global development. This is why the reforms in the multilateral systems –particularly in United Nations University (UNU) structures, methods and philosophy are so urgent.

This is also why UNU seeks to stimulate reflection on the multilateral system and on the relations between governance and globalization at world level. Governance describes the modalities, values and institutions employed to organize human life at all levels, within and between societies.

In the framework of the Millennium goals, UNU seeks to launch elements for a new set of attitudes with a view to constructing a more fair society, in which everyone would have the same rights and be respected with their differences. This explains why, accepting a proposal made by the President of the Government of Spain, Zapatero, the Council of UNU decided to approve the creation of a new Research and Training Centre on the Alliance of Civilizations. The Alliance should be the result of a process of dialogue between and within civilizations, founded on inclusion and a collective desire to understand and examine assumptions, investigate shared meanings and core values and integrate multiple perspectives through dialogue.

The priority activities will be based on a report by a special group co-chaired by Federico Mayor (Spain) and Mehmed Aydin (Turkey), covering the fields of Education, Migration, Media and Youth. As a relevant factor in the dissemination of values and in the formation of society's thinking, the media are responsible for disseminating local culture and the events that occur in the world. The media can be partners in the process of creating solidarity between different cultures. Some themes could be handed through an approach focusing on intercultural dialogue: the production of knowledge through the media/media liberty and responsibility/impacts of the cultural media/internet and communication/media and migration.

UNITED NATIONS GLOBAL ALLIANCE FOR ICT AND DEVELOPMENT (UN-GAID) COMMUNITY OF EXPERTISE IN ICTS IN EDUCATION

UN GAID – Education focus area – ICTs in Education

Lead organization: Talal Abu-Ghazaleh College of Business – Member organizations: GeSCI; Cisco systems; UNESCO; Digital Opportunity Trust; Royal Holloway University of London

BACKGROUND

Education has largely contributed to an increase in developing knowledge, providing an enabling environment for innovation, and in building human capital required for a potential future knowledge economy. Global reforms in education and challenging ICT demands have made a remarkable shift in the structure of the enabling ICT environment and the utilization of ICT technologies in education. Such technologies have become the key driver of the digital network in an era of technology-driven education. More schools and communities now have access to ICT resources to join the global economy with knowledge workers who have 21st century skills and are inspired by life-long learning. The Dakar Framework of Action for Education for All (EFA), adopted in 2000 as a roadmap to meet the Education for All goals by 2015, highlights the role that ICT has to support EFA goals at an affordable cost. ICTs have great potential for knowledge dissemination, effective learning and the development of more efficient education services³. Much effort has been made towards the advancement of education and multi-literacies.

The UN GAID (Global Alliance for ICT and Development) has been established in 2006 to address globally cross-cutting issues related to ICT in development and respond to the need for cross-cultural and cross-sectoral dialogue among diverse stakeholders. Some of these issues and challenges are: Lowering cost of access in the developing world; developing inclusive technologies for the disabled; producing low-cost computers; and reducing barriers to ICT use and diffusion in key sectors of the economy and society, including enterprises, governments, education, tourism, agriculture, financial services and rural and civil society institutions.

Alliance of Civilizations (AoC) established in 2005, to explore the roots of polarization between societies and cultures, and to recommend a practical programme of

³ Science 321:745 (2008)

action to address this issue. AoC's main objectives: develop a network of partnerships to share the goals of the Alliance of Civilizations, to reinforce their interaction and coordination with the UN system; develop, support, and highlight projects that promote understanding and reconciliation among cultures; and establish relations and facilitate dialogue among groups that can act as a force of moderation and understanding during times of heightened cross-cultural tensions.

TAGorg (Talal Abu-Ghazaleh Organization), founded in 1972, is now the largest pan-Arab professional group offering diversified and expert services with commitment to communities and societies. Through TAG Knowledge Societies (TAGKS) and TAGI Book initiative – towards a broader and more inclusive information society in the Arab world – the young generation of the Arab world will have more access to the internet, benefit from available professional development resources and content, use online language and ICT Skills.

e-Skills Industry Leadership Board (eSkills ILB) founded in 2007 with a vision to foster 21st century e-skills and digital literacy of Europe's workforce and citizens for a competitive, innovative and inclusive Europe. The e-Skills ILB is set to lead the ICT sector's contribution to the development and implementation of a long term e-skills and digital literacy agenda in Europe.

GAID has established communities of expertise (CoE) to address ICTD problems in a results-oriented manner and disseminate best practice. CoE are clustered in four focus areas: governance, entrepreneurship, education, and health. An overview of TAGCB effort on "ICTs in Education" and the initiative to build cooperative links among stakeholders to help advance development and spread benefits of ICT in education.

Similar efforts exist around the world, which also aim at advancing education for better literacy. This community of expertise in "ICTs in Education" is intended as a contribution to bring together scientists, public authorities, businesses, academics, civil society organizations and other interested groups and stakeholders to understand challenges for sustainable education in the global context; identify the potential of ICT to advance and improve education; share knowledge and best practices about successful policies in global education; create venues of collaboration; and consolidate responsible communities for more access to ICT resources of knowledge and content.

VISION

Create a continuous dialogue and coordination process among stakeholders on Education to empower ICT and support academic activities and services through ICTs in order to maximize performance, improve teaching and learning processes, promote academic excellence, enhance productivity, and improve quality of research on education and learning processes

OBJECTIVE

Create a community of practice to permit educators, public authorities, NGOs, academics and all other stakeholders to identify the potential of using ICTs to advance and improve education, barriers to using ICTs, in education and to share knowledge and best practices about successful use of ICTs in education

GOALS

- Increased use of ICT technology and knowledge to improve quality of education services and effectiveness of ICT in learning
- Improved ICT infrastructure and technology applications to increase access to ICT resources and services
- Well-defined policies, regulations, and standards and disseminating best practices in ICT resources, services, data usage and their successful use in education
- Repository of resources, best practices and case studies
- Web publishing for ICTs in education and virtual exhibition of world-renowned ICT products and services in education
- Community clusters among organizations and individuals on development of resources to promote ICTs in education and on R&D for advanced forms of education and learning processes.
- Global community of practice enabling communication and sharing of resources.

SCOPE

- *Accessibility*: facilitate easy and quick access to ICT-rich teaching and learning resources including ICT systems and services, computing resources, online learning materials, e-Learning, and other education centred applications
- *Empowerment*: empower educational communities with ICT technologies and continuously upgrade their ICT-driven teaching and learning skills
- *eLearning*: encourage the use of eLearning and adoption of its tools and technologies to facilitate widening access to learning and improving educational achievements
- *Enabling environment*: facilitate the establishment of stable, robust, secure and efficient ICT enabling environment and strengthening its availability and reliability and providing mobile and remote access to a repository of learning resources
- *Learning and teaching methodologies*: enhance learning and teaching methodologies through the use of ICT technologies and encouraging education-centred teaching mechanisms

- *Lifelong learning*: develop a framework for web enabled lifelong learning through continuous education and training
- *Research and development*: promote innovation culture and encourage applied research and development among communities for advanced forms of education and learning processes
- *Policy*: Develop legal, policy, and regulatory frameworks to promote competition and investments, protect intellectual property, and stimulate innovation
- *Sharing and dissemination*: on the worldwide web, provide forums, publications, and free space for ICT companies and stakeholders to share and disseminate accumulated knowledge, information, experiences, and products and services related to ICTs in education
- *Sustainability*: maintain a constant pace of development to sustain and reproduce knowledge for a continuing effort on ICTs in Education to meet new demands

DELIVERABLES

Accessibility:

“Facilitate easy and quick access to ICT-rich teaching and learning resources including ICT systems and services, computing resources, online learning materials, e-Learning, and other education centred applications”

- Plans for increased access to ICT resources including eLearning, digital libraries, etc.
- Establishment of knowledge centers and societies and open content communities
- Framework for increased broadband connectivity
- Freely available open content
- Legislations, usage rules and code of ethics to assure rights of access, security, privacy, and protection against acts of misuse

Empowerment:

“Empower educational communities with ICT technologies and continuously upgrade their ICT-driven teaching and learning skills”

- Plans for enhancing ICT skills and continuous training
- Exchange of staff among educational communities
- Courseware and content grouped in catalogues for easier search

eLearning:

“Encourage the use of eLearning and adoption of its tools and technologies to facilitate widening access to learning and improving educational achievements”

eLearning practices

- Guiding framework and legislations governing eLearning practices and distance education
- Simulating content development among educational communities
- eLearning initiatives for promoting learning and educational technologies research
- Awareness sessions and events on eLearning content development, use of learning management systems (LMS) and content management systems (CMS)
- eLearning centers of excellence for sharing/exchanging eLearning content, development tools, professional expertise and experience.
- Sharing professional development resources

Enabling environment:

“Facilitate the establishment of stable, robust, secure and efficient ICT enabling environment and strengthening its availability and reliability and providing mobile and remote access to a repository of learning resources”

- Learning environments and knowledge societies
- State-of-the-art teaching and learning technologies in educational institutions
- Community sponsorship and resource sharing
- Smart computing facilities and laptops
- Sharing infrastructure and solutions architectures

Learning and teaching methodologies:

“Enhance learning and teaching methodologies through the use of ICT technologies and encouraging education-centred teaching mechanisms”

Distant education to support international collaboration

- Multimedia technologies and Web-Learning
- Student-centred teaching methodologies through skill-transfer and capacity building programs

Lifelong learning:

“Develop a framework for web enabled lifelong learning through continuous education and training”

- Enabling lifelong learning and connections between academic learning and experiential learning
- Building desire and skills for personal and professional development through lifelong learning

Research and development:

“Promote innovation culture and encourage applied research and development among communities for advanced forms of education and learning processes”

- Communities of interdisciplinary research to create focused set of curriculum resources, professional development resources and content, learning objects/ tools, assessment objects, and support tools
- Communities of leading experts and professionals in education

Policy:

“Develop legal, policy, and regulatory frameworks to promote competition and investments, protect intellectual property, and stimulate innovation”

- Legal, policy, and legislation and regulatory framework

Sharing and dissemination:

“On the worldwide web, provide forums, publications, and free space for ICT companies and stakeholders to share and disseminate accumulated knowledge, information, experiences, and products and services related to ICTs in education”

- Web publishing for ICTs in Education to disseminate knowledge and information
- Virtual exhibition of world-renowned ICT products and services on education
- Published discussion forums, news, and advertisements to enable collaboration between specific working groups
- Organized directory of resources (people, institutions, services, etc.)
- Showcase / case studies of effective use of ICTs in education.

Sustainability:

“Maintain a constant pace of development to sustain and reproduce knowledge for a continuing effort on ICTs in Education to meet new demands and requirements”

- Base-line data set established to facilitate Impact assessment of efforts on ICTs in education
- Educational ICT companies contribute to maintain a constant pace of development

MOVING FORWARD

The Community of Expertise in ICTs in Education is lead by TAGCB, and is an open network for individual experts, ICT companies, NGOs, organizations, and institutions. Through an executive board, different working groups will be assigned for each defined scope: *Accessibility; Empowerment; eLearning; Enabling environment; Learning and teaching methodologies; Lifelong learning; Research and development; Policy; Sharing and dissemination; and Sustainability*. TAGCB will facilitate and support the information and knowledge of this community, and will make available a Web portal to host, share and demonstrate best practice, knowledge, content, case studies of effective use of ICTs in education.

During ICC/ EBITT meeting which was held in Dubai during 15-16 October, 2007, there has been a consensus among members to proceed with this initiative CoE in ICTs in Education with TAGCB being a leading institution. Representative from Oracle, Boeing, and others showed interest to participate in this effort. It is crucial to move from consensus to action to sustain momentum. The first step will be to expedite the review of this draft, then to deepen and broaden collaboration on the scope elements given in this document. Annual reports will be submitted to GAID on the progress of the efforts of CoE towards the set goals. We call upon ICC / BASIS, EBITT and UN-GAID to encourage cooperative efforts among stakeholders for education to make this work a success.

Potential participants

- Companies specialized in ICTs and are interested in supporting Education towards more ICT access;
- Educational institutions interested in providing open content;
- Policy makers responsible for education development;
- Funding agencies interested in program development and dissemination;
- Academics doing research in ICTs for education

Essential activities needed to move forward

- Launching CoE in “ICTs in Education” – interested members meet for familiarization; agree on roles, responsibilities, terms of reference, needs identification; and formulate technical committees and workgroups. Committees and groups drive forward tasks, developing concepts, implementation methodologies, and more
- Technical committee and work groups conduct regular meetings to follow up on action plans, review progress, track project deliverables, and to hold knowledge sharing workshops

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- Conduct feasibility studies and analysis on technology requirements with the scope of the initiative defined above
 - Develop and conduct a baseline survey in a number of countries covering institutions, enterprises, public authorities, and organizations on ICT awareness and acceptance.
 - Analyze needs and requirements based on survey data for increased ICT adoption, literacies, access barriers, and experiences
 - Conduct expert group meeting for reviewing analysis, survey, and requirements results, then developing strategies and recommendations for a widespread promotion and adoption of ICTs in Education
 - Conduct a workshop for information sharing and dissemination of needs, policy and strategy, recommendations
 - Build diversified local communities of expertise in different fields
 - Establish coordination procedures among these communities for sharing, dissemination, and global outreach
 - Building centers of excellence in ICTs in Education as sources of expertise and continuous development of technology needs in Education. The centers will also provide online support and inventory of educational contents through Web Portal
 - Developing and maintaining an online support of educational products, material, expert groups, and support information
 - Developing and maintaining a directory of local content for increased access to information/knowledge and open course ware in education and technology
 - Collecting and publishing best practices and case studies in ICTs in Education
 - Developing marketing material (brochures, posters, stands, booklets,...) and participating in national and international exhibitions, fairs, and conferences.
 - Organizing technology focused Summer camps for high school students, university students, and community groups
 - Providing business/technical training and skill development/capacity building programs
 - Conduct a knowledge & information sharing conference for dissemination to communities
 - Create a sustainable network among participating institutions, enterprises, organizations, and communities within a framework of a sustainable model for the communities of expertise in ICTs in Education
 - Continuous assessment of progress against the set goals and objectives

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- Establish a management office to coordinate activities and to ensure accountability and delivery of tasks

Funding requirements

Developing mechanisms for sustainable creation of trust funds to sponsor CoE

Create continuous funding scheme for a sustainable community to ensure continuous development in ICTs in Education – this can be achieved through membership, support fees, etc.

GLOBAL E-SCHOOLS AND COMMUNITIES INITIATIVE – TOWARDS KNOWLEDGE SOCIETY FOR ALL

Jyrki Pulkkinen

CEO, Global eSchools and Communities Initiative (GeSCI)

While the developing world is still struggling to address the basic needs of its people, the rest of the world is transitioning to a Knowledge Society. In the world economy, knowledge is increasingly the key factor of production as well as a raw material for economic development. Information, knowledge and innovation based businesses are taking over many of the traditional sectors of commerce and industry. While the transition to knowledge-based economies and societies is progressing, the gap between developing countries and developed or industrialised countries is widening.

At the forefront of international thinking on economic development is the consideration of ICTs, and ICTs and Education, as key factors in economic growth. It is acknowledged that transitioning successfully to the knowledge society requires investment in education, innovation systems, ICT infrastructure, and development and implementation of those policies that support such a transition. In addition, enabling economic environments and strong institutions are also needed. Education in the knowledge society is critically important – not only is it the source of basic skills, it is also the foundation for the development of new knowledge and innovation.

While the importance of education is commonly accepted, the world – especially the developing world – faces severe challenges with regard to education. These challenges can be summarised as: a lack of universal access to education; poor quality of education; poor management of the education system and the increasing irrelevance of the current education system in the knowledge society. An adequate information and communication infrastructure and the proper employment of ICTs in education can help to tackle some of these challenges. In this context it is important to understand that ICT is not only a new booming sector of the economy, but it is the global infrastructure of knowledge and innovation. ICTs have the potential to widen access to educational resources, improve the quality of learning, and improve management efficiencies of the education system. It is also important for developing countries to equip tomorrow's citizens with the increasingly important skills related to science and technology (including ICT skills, problem solving skills, collaboration skills and higher learning skills). ICT can help the education system to achieve this mission. More criti-

cally, ICTs have the potential to transform education; a potential that many developed countries are doing their best to harness.

The potential of ICTs to tackle some of the challenges facing education in the knowledge age has led to many developed countries investing massively in ICTs. Developing countries are fast following suit, with many placing ICTs and ICTs in Education at the centre of their development strategies. However, developing countries are less endowed in terms of capacity and capabilities and resources- human and financial- to successfully and effectively harness the potential of ICTs. With this in mind, GeSCI was founded by the UN ICT Taskforce in 2003, and began operations in 2005 working initially with Namibia, Ghana, India, Bolivia and later Rwanda.

Our mission is to help Ministries of Education (MoEs) in some of the world's poorest countries to make informed strategic decisions about ICTs in Education. At the heart of GeSCI's mission is the concept of Knowledge Sharing: working together with its developing country partners to strengthen their own knowledge systems and to develop their strategic capacity to effectively manage, deploy and integrate ICTs in their education systems. GeSCI believes that the proper and effective use of technology in education can improve the quality of teaching and learning at all levels of the education system, formal and informal education as well as pre- and in-service education. We are committed to the creation of a world where every learner has access to a standard of education which can help them to improve their lives, a knowledge society for all. To this end GeSCI will work with partners at local, national and international levels who support this vision.

Over the next three years, there will be three key outputs of GeSCI's work in support of its mission and vision. These outputs are related to GeSCI's main products and are: i) Strategic advice to MoEs that leads to successful large-scale deployment and integration of ICTs in their education systems; ii) Development of high-quality and relevant "knowledge products and services" such as knowledge tools and research that advances our overall understanding and strengthens the capacity of developing countries to leverage ICTs in education; and iii) Promoting and facilitating global policy dialogue on ICTs for Education as a way of contributing to the general understanding and development of the knowledge society.

In order to achieve the outputs, a number of key activities will be carried out and these include:

- Country programmes involving direct advisory engagement with developing country MoEs on a system-wide (whole education system rather than piecemeal) basis to provide high quality strategic advice and support to the countries' own plans, policies and efforts to deploy and integrate ICTs in education.

GeSCI will work with a small number of carefully selected countries with a target of having supported 9-12 countries by the end of 2011.

- Further development of regional programmes to involve knowledge sharing between GeSCI and the partner countries and between the partner countries, at the regional level in Africa, Asia and Latin America.
- Development and sharing of knowledge products and services through the identification of major knowledge gaps or common challenges related to ICTs in education. GeSCI will seek to fill these gaps or tackle these challenges through partnerships, promoting research or commissioning its own research. GeSCI will seek to produce 1-2 knowledge tools or published research per year.
- Promoting partnerships and facilitating global dialogue by leveraging ICTs to promote communication and collaboration with a diverse number of partners, globally, regionally and locally.
- Improving the governance and management of GeSCI including addressing important organisational issues such as developing a robust knowledge management system and effective (internal and external) communication systems.

At the country level, GeSCI will select new countries based on a set of mandatory and desirable criteria with a focus on country ownership, commitment and leadership of the ICT4E agenda, a focus on sub-Saharan Africa (SSA) and an alignment with our donors' priority countries and programmes. At the same time, GeSCI will seek to transition some of the existing country programmes (India, Bolivia and Ghana) from full-time support while ensuring the sustainability of its interventions to-date.

At the regional level, GeSCI will seek to strengthen its Africa Knowledge Exchange (AKE) knowledge sharing forum and to replace its programmes in India and Bolivia with knowledge-sharing forums in Asia and Latin America respectively. The regional work in Asia and Latin America will be undertaken primarily by establishing strategic partnership with existing regional organizations

In order for GeSCI to achieve its mission and successfully carry out the envisioned activities, it will need to work with and cooperate with all of its strategic partners: the developing country governments, its donors and other development partners and other expert organisations at the local, regional and global level. The new strategic plan for 2009-2011 lays out, in more details, the goals, strategies and activities that GeSCI will undertake in the next three years.

PAPERS ON THEORY AND PRACTICE

MEDIA LITERACY AND INTERCULTURAL DIALOGUE

Tapio Varis

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This year 2008 is the European Year of Intercultural Dialogue, and the Commission has invited the European institutions to incorporate an intercultural dialogue concern in their media literacy activities. Also the UN Alliance of Civilizations (AoC) established in 2005, explores the roots of polarization between societies and cultures.

Both give a high priority to media literacy education that will develop, support, and highlight projects that promote understanding and reconciliation among cultures; and establish relations and facilitate dialogue among groups that can act as a force of moderation and understanding during times of heightened cross-cultural tensions.

The AoC is a results-oriented UN initiative aimed at improving understanding and cooperative relations among States and peoples across cultures and religions in the areas of youth, media, education and migration. The President of Finland, Mme Tarja Halonen, is among the strong supporters of the AoC initiative. As noted by Mr. Koichiro Matsuura, Director General of UNESCO, in the First AoC Forum in Madrid in December 2007, the UNESCO Chair Network is an excellent world-wide network for the implementation of the ideals of AoC. According to the UNESCO philosophy "It is necessary to build up large movement to humanize globalization, based on solidarity, on the spirit of caring for and sharing with others". For this purpose the Open Educational Resources (OER) initiative as a cooperation mechanism for the open, non-commercial use of educational resources.

In the UNESCO Report on Knowledge Societies (2005), there is a general agreement on the appropriateness of the expression "knowledge societies"; the same cannot be said of the content. Special efforts have been made to develop the new renaissance education and build global cultural bridges together with artists. It is widely understood that the most important skills of the future will be communication skills. Critical thinking skills are needed as a productive and positive activity. Critical thinkers see the future as open and malleable, not as closed and fixed.

In his epilogue on "Education for a multicultural world" to the International Commission on Education for the Twenty-first Century published by UNESCO in 1996 Rodolfo Stavenhagen pointed out that most modern nation-states are organized on the assumption that they are, or should be, culturally homogeneous. That is the es-

sence of modern 'nationhood', upon which contemporary statehood and citizenship are founded. But a truly multicultural education will be one that can address simultaneously the requirements of global and national integration, and the specific needs of particular culturally distinct communities, both in rural and urban setting (Stavenghagen 1996, p.230-231).

Muhammad Abdus Salam (1926 – 1996) wrote on science, technology and science education in the development of the south. He said that science and technology are cyclical. They are a shared heritage of all mankind. East and West, South and North have all equally participated in their creation in the past as, we hope, they will in the future – the joint endeavour in sciences becoming one of the unifying forces among the diverse peoples on this globe (Salam 1990, p.24)

Already in 1923 Albert Schweitzer wrote about the tragedy of the Western world-view. In his view our philosophy did nothing more than produce again and again unstable fragments of the serviceable outlook on life which hovered before its mind's eye. Consequently our civilization also has remained fragmentary and insecure. Our philosophizing became less and less elemental, losing all connection with the elementary questions which man must ask of life and the world. More and more it found satisfaction in the handling of philosophic questions that were merely academic, and in expert mastery of philosophical technique. It became more and more the captive of secondary things (Schweitzer 1967, p.5-6).

Therefore, a demand of a new renaissance education has emerged in Europe and the United States. It would combine science and technology with the art, humanities and religion. In addition to this, new media and digital literacies are needed (Varis 2000). Media education should be aimed at children, parents and teachers and should be a life-long process which requires a co-ordinated approach also involving non-governmental organisations and media professionals (Council of Europe, Doc. 8753, 6 June 2000).

The European Commission set up in 2006 a Media Literacy Expert Group with the aim of analysing and defining media literacy objectives and trends, of highlighting and promoting good practices at European level and of proposing actions in the field. The analysis and assessment of the European Commission's previous activity (for instance, media literacy projects funded within the eLearning programme) were also discussed and examined. The work of this group was used for the Communication A European approach to media literacy in the digital environment by the Commission of the European Communities in December 2007 (COM(2007) 833 final)

A study on "Current trends and approaches to media literacy in Europe" was commissioned in May 2006. It maps current practices in implementing media literacy in Europe, confirms the tendencies which emerged in the public consultation and rec-

ommends some measures to be implemented at Community level to help foster and to increase the level of media literacy. Finally, it briefly outlined the possible economic and social impact of an EU intervention in this field. (http://ec.europa.eu/avpolicy/media_literacy/index_en.htm)

The concept of digital literacy in a broad sense is a way of thinking but it can also be understood as complementary to the concept of media education and even synonymous with media literacy. Digital literacy as media literacy aims to develop both critical understanding of and active participation in the media. Digital and media literacy is about developing people's critical and creative abilities. Using a computer requires diverse and complex previous knowledge. It also introduces the individual and humanity to new contexts, which demands mental, intellectual, profound and complex changes. In essence, digital literacy is a complicated process that consists of acquiring a new tekne, ability of art or craft. Creativity and culture become essential raw materials for the knowledge economy.

MEDIA LITERACY, DIGITAL LITERACY, CULTURAL LITERACY

The European media literacy definition is: "the ability to access the media, to understand and to critically evaluate different aspects of the media and media contents and to create communications in a variety of contexts. Media literacy relates to all media, including television and film, radio and recorded music, print media, the Internet and other new digital communication technologies".

The term 'literacy' refers to the practical command of the alphabet, of the signs and symbols of reading and writing. "This term still applies to the core or foundation literacies of learning how to read, how to write, and how to perform simple numeracy tasks necessary in everyday life".

The term 'literacy' originally referred to reading, writing and calculating but includes now the set of knowledge and skills that make a 'learned' person a citizen with the ability to understand his or her cultural surroundings. It was not a long process before it became clear that this capability directly depended on the ability to understand messages critically and act with autonomy.

All of these ideas linked to classic or basic literacy are included in the meaning of the new expression 'media literacy' that in fact is broader. It includes the consideration about all media: old and new –in fact there is a convergence. Hence, it is considered that it is not possible to effectively understand or get by in the contemporary world without this media competency.

Media literacy and concepts such as 'digital literacy', 'computer literacy', 'cultural literacy', 'information literacy', 'audio-visual literacy', 'media education', are used alternatively in the literature.

Media literacy, understood in its inclusive sense, implies a broadening, but also a reinforcement, of the function attributed to basic literacy. It is not linked, therefore, to a simple technical skill (the use of the media), but rather has to do with understanding, critical reading, the ability to analyse and reason, social participation, human relations, and the use of symbolic and cultural codes and conventions.

UNESCO TRADITION AND EUROPEAN APPROACH

The concept of media literacy –and media education- can be contextualized within two UNESCO advocacies, i.e. the human rights-based approach to programming and the creation of Knowledge Societies. Access to quality media content and participation in programming are principles promoted by media education and information literacy and are among the cornerstones of the universal right to free expression. Media education and literacy likewise facilitate the building of Knowledge Societies. In this sense, the concept of media literacy must be linked with the idea of Education for Sustainable Development (ESD) included in the United Nations principles where has been founded the declaration of the Decade 2005-2014 for ESD in which UNESCO is the lead agency. The aim is to integrate principles –as media literacy-, values, and practices of sustainable development into all aspects of education and learning.

Media education has been marked out and defined by UNESCO in a series of works that has a milestone in the Grünwald conference (1982) and continued with the conferences held in Toulouse (1990), Vienna (1998), Seville (2000), Paris (2005 and 2007), and Riyadh (2006), among others.

UNESCO formalised the concept of media education over three stages. The first, represented by the Grünwald Declaration of 1982, was to constitute the area of media education, and served to draw attention to media impact on training and education. The second, represented by the Toulouse conference in 1990, was to systematise and define more accurately the field. Thirdly, the Vienna conference of 1998 served to relocate the question of media education in the specific field of advances in the digital sphere and of the new age of communication that began with these advances. Finally, the Seville seminar of 2008, served to call for the need to take action through active policies of promotion in the following fields:

- Research
- Training
- Cooperation between schools, Media, NGOs, private companies and public institutions
- Consolidation and promotion of the public sphere of society and its relationship with the media

The concept of Information Literacy has been also elaborated in the context of the International Action Plan for Implementing Resolution 56/116 of the Dakar Framework for Action (“Founding Resolution”) for the United Nations Literacy Decade. This plan calls for a renewed vision of literacy that goes beyond the limited view of literacy that prevailed in the past. The High Level Colloquium on Information Literacy and Lifelong Learning (Alexandria, Egypt, November 2005) established a definition of Information Literacy and proclaimed that “it is a basic human right in a digital world and promotes social inclusion of all nations”.

The Alexandria Proclamation of 2005 summarizes a definition of Information Literacy that has been adopted by UNESCO and that it is in connection with the media literacy. It is the capacity of people to:

- Recognise their information need;
- Locate and evaluate the quality of information;
- Store and retrieve information;
- Make effective and ethical use of information, and
- Apply information to create and communicate knowledge.

If we take into account that almost all these processes imply media and technology, we’ll dispose then of a complete model of information and media literacy. Models that include: a) “access to information and, b) effective use of information” and introduce a very important goal in relation to the people: “to move from dependence on ‘knowledge brokers’ to become ‘knowledge builders’”. (Towards Information Literacy Indicators, Paris, UNESCO, 2008, and OECD Measuring the Progress of World Societies: The Istanbul Declaration. 2007)

According to the European Commission, media literacy represents a variety of skills and competences related to the media, its images, languages and messages: “Media Literacy may be defined as the ability to access, analyse and evaluate the power of images, sounds and messages which we are now being confronted with on a daily basis and which are an important part of our contemporary culture; as well as to communicate competently using media available, on a personal basis. Media literacy relates to all media, including television and film, radio and recorded music, print media, the Internet and their new digital communication technologies”.

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ISLAMIC WORLD AND WESTERN WORLD: IS THERE MUTUAL UNDERSTANDING?

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This question about mutual understanding between the two cultures that have been living close to each other and also influencing each other for well over a millennium is a very challenging task. There seems to exist a lot of mutual suspicion and even mistrust, especially if one is only reading current headlines in newspapers. I try to approach the issue in terms of both historical developments but also in terms of the current trends in the global educational field, which hopefully indicate a lot of mutual interests and mutual benefits between the two cultures.

Yet historically, the development of the European or western civilisation and culture has been strongly influenced by the Islamic world and its philosophy and science. The Qur'an was revealed to Muhammed in the years 610-632, and the following development of Islam took by two major paths that influenced the European history profoundly.

First, it created an Islamic Renaissance in the 8th through the 12th century, virtually in every field of human endeavour, especially by exposure to the Hellenic culture and philosophy. It created strong cross-cultural networks, freedom of speech, a number of new institutions and even degree-granting universities, magnificent public libraries and also hospitals, common law, etc. The entry of Hellenic culture and thinking into the Islamic world took place through active translations into Arabic of the works of Plato, Aristotle, Archimedes, Euclides, and many others, starting in the 8th century.

This Islamic Renaissance produced a number of great Islamic thinkers, astronomers, geographers, mathematicians, architects, poets, etc., whose influence is still felt in the western world, though not always recognised as such. Also, we are still using the 'Arabic numbers', though actually their origin is in India, and the Arabs transmitted them to Europe. The same applies to the concept of 'zero' (0), which is also of Indian origin and was introduced to Europe in the 12th century.

Second, the Islamic world suddenly turned west, and in less than a century, in ca. 750, it reached the Atlantic, and thus all of the southern lands of the Mediterranean were under the Islamic influence, and of course most of Spain too. It was one of the first true processes of globalisation, from Samarkand in the east to Cordoba in the west, with Mecca later serving as a point of 'Internet'.

In many ways, the Islamic Renaissance came to influence strongly the European Renaissance, less than a millennium later. The return of Greek and Islamic thinking back into Europe took place mostly by Latin translations, especially from Spain and Sicily, in the 12th century on, via Sorbonne, Bologna, etc., and in fact, gradually its influence was felt throughout western Europe. This was also the beginning of the concept of 'modern' university, in the 11th century.

Now, when we are asking about the possibility of mutual understanding between the Islamic and the Western world, there maybe is a common field where a kind of global understanding is developing between different cultures. All governments are now hard pressed to meet the basic human needs and to tackle the new global and regional challenges. The role of education at large is seen crucial, and also a number of Islamic states have indicated their national target as being 'The Knowledge Society'. Actually, this seems to be the nearly universal goal in the contemporary era.

About a century ago there were about 700 universities in the world, out of which ca. 500 were in North America. The current number of higher education institutions in the world is estimated at the order of 17,000. Especially in the last few decades there has been a strong 'massification' of higher education, and now we may even speak about a true global market in education and in higher education in particular, when more and more people are looking for educational opportunities.

Actually, the knowledge-based society can be built best through global and regional cooperation and through mutual understanding and respect. We may also ask whether this is a new era of Enlightenment or even a new Renaissance, when people are actively wanting to obtain education: 'Dare to know'! We already have made available global educational technologies, but is it enough that everybody has passed a course in Information Technology (IT)! Thus we may pose also another question: do we need a knowledge-based society, or a civic society? Or maybe both of them at the end!

In short, education seems to become the key factor in regulating the relationship between an individual and the state/society. In this sense education is replacing the citizens' tax system.

Finally, the issue of common values is no less important. Ismail Serageldin, Director of the Library of Alexandria, Egypt, has recently written⁴: 'There is a central core of universal values that any truly modern society must possess, and these are very much the values that science promotes: rationality, creativity, search for truth, adherence to codes of behavior, and a certain constructive subversiveness. Science requires much more than money and projects. Science requires freedom: freedom to enquire, to challenge, to think, and to envision the unimagined.'

This is a common challenge for both the east and the west.

⁵ Science 321:745 (2008)

ICT FOR SUSTAINABLE EDUCATION AND CULTURAL LITERACY – A GENERAL VIEW?

Okyay Kaynak

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My presentation will be focused on adoption and diffusion of IT for sustainable education and cultural literacy.

If we had a look at the industrial developments that took place in the 20th century, the first half could be said to be hardware dominated in the sense that the improvements in productivity and product quality were mostly due to improvements in “the hardware.” The operational speed and the accuracy of the industrial machinery steadily increased, mostly due to the improvements in the precision of the mechanical parts. Along the same lines, the early second half could be said to be software dominated. It was the software used in microprocessor based control systems that enabled a production line to operate faster and more accurately. Even the improvements in industrial machinery (the hardware) were due to the possibilities offered by Computer-Aided Design and Manufacturing. The era of industrial electronics got started around this period, industrial automation in the form of mechanical controls and switches, slowly giving way to electronic controls and signal processing. The last few decades of the century, on the other hand, are characterized by the fusion of different technologies, such as electromechanics, optoelectronics, mechatronics, bioinformatics, and so on. The most important fusion has taken place between computing and communication technologies under the name information technology (IT) and the decades we are living in have been dubbed as the information age. The characteristics of the information age are as follows:

- Hybrid
- Complex
- Short life cycle of technological products
- Borderless
- Enabling
- Dynamic

These characteristics pose a great challenge in front of the growing economies for the adoption and diffusion IT.

For the diffusion of IT in a society three basic levels can be identified:

Substitution:

- Understand and document the process to be IT assisted,
- Substitute IT for the existing technology.
- **Result: Modest gains**

Enhancement

- Alter the production process with the help of IT.
- Redesign the process based on identified needs and recently acquired technological capabilities
- **Result: Increased quality, productivity, efficiency**

Transformation

- Reconsider and redefine the role of the process in the larger production system,
- Change the structure and the organization of the production, move into new product strategies, new products.
- **Result: Maximum effectiveness in the sector and efficiency increases**

In each level, the following adoption stages can be identified:

- Information Stage
- Analysis Stage
- Acquisition stage
- Utilization Stage

There exist barriers between stages, which can only be overcome with the use of appropriate mechanisms. Some of the barriers are due to factors such as traditional academic values, hollowed collegiality and placing more importance on research than teaching (publish or perish!).

In the information age, with the adoption and diffusion of IT in the society it is to be expected that the concept of graduation will become obsolete and a full integration of education and work will take place and we are likely to see the following paradigm shifts:

- From just-in-case teaching to just-in-time learning,
- From 3 “R”s (Reading, wRiting, aRithmetic) to 3 “S”s (Searching, Sharing, Simulating) with a sound knowledge of science.

The following important changes are also worth to be noted:

- Knowledge industry is developing,
- The border between high school and college is becoming very gray,
- So is the border between advanced degrees and continuing education,
- Software is becoming like a literature.

As concluding remarks, it can be said that great challenges face the teaching institutions especially the universities. It may be time to redefine the role of the universities in the society in the form of 3G universities.

THE DEVELOPMENT OF NATIONAL EXCELLENT COLLEGE COURSES (NECCS) AS OER IN CHINA

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Higher education in China has witnessed great expansion since June, 1999. The gross enrollment rate (GER) of the age-cohort (18-22 years) increased from 6.8% in 1998 to 17% in 2003, demonstrating that China has entered the stage of mass higher education, according to Martin Trow's theory (Trow, 1984). In 2007, the GER further increased to 23%. Figures 1 to 4 (in the full paper) show the expansion of higher education in China over the past decade. Student number in Chinese HEIs increased from 6.43 million in 1998 to 27 million in 2007, almost about 4 times that of 1998. The number of Regular HEIs increased from 1022 in 1998 to 1908 in 2007. The number of Adult HEIs decreased from 962 in 1998 to 413 in 2007, thus the total number of higher education institutions increased from 1984 in 1998 to 2321 in 2007. Staff and teacher numbers increased from 1.02 million in 1998 to 1.945 million in 2007.

Facing the tremendous changes and demand of higher education in China, plus further needs of facilitating lifelong learning and building a knowledge society, the Ministry of Education (MOE) of the People's Republic of China promulgated Project Plan on Developing *National Excellent College Courses of China* (NECCs for short in this paper) in 2003. The project plan was to develop 1500 NECCs in 5 years from 2003-2007 and to publish all the course materials on the internet as Open Education Resources (OER) enabled by modern educational information technology. In 2007, the Ministry of Education (MOE) and the Ministry of Finance (MOF) jointly issued "The Ideas on Enhancing University Education Quality and Teaching Reform in Higher Education Institutions (HEIs)", launching plans for further developing 3000 more NECCs from 2007 to 2010.

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This study mainly serves as an introduction and overview of the NECCs in China. It is done mainly through policy document studies and literature review. In recent years there are a series of studies on the development and implementation of NECCs. Liang and Jia (2007) made a study of the 2003-2005 NECCs, offering an analysis of the regional and disciplinary distribution of NECCs, the development of the project teams, and the overall teaching and learning profile of the NECCs (pp. 48--51). Huang and Xiang (2007) made a thorough analysis of important elements of 688 accessible courses from the 2003-2006 NECCs, including NECCs resource building, curriculum implementation, access to and the use of NECCs, and offered some comments and recommendations (pp. 72-76). Gong (2008) engaged in a study of the 2003-2007 NECCs and offered a policy understanding, the implementation of NECCs and what kind of Higher Education Institutions (HEIs) play an important role in the development of NECCs. He maintains that the building of the NECCs pays more attention on construction of the courses and resources, but he would like to see more active use and more sharing of the NECCs resources. The most important element of NECCs, he stresses, is to establish an appropriate mechanism to promote the openness and sharing of the course contents and resources all year around, instead of only during the assessment and evaluation months (47-49).

Consolidating what we find from the policy studies and literature review on the development of NECCs this paper covers the purpose and the characteristics of the NECCs, an analysis of the structure, the use and impact of NECCs as OER and a discussion about the pros and cons of the current situation of the usage of the courses, as well as a foresight of its future developments.

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GENDER ASPECTS FOR E-LEARNING

EXPERIENCE IN APPLYING THE MOODLE PLATFORM AND THE GENDERING ASPECT

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It is common knowledge that the percentage of female students studying in scientific, engineering and technological disciplines is low. In fact, less than 10% of graduates from these programs are female – even during times when there is a high demand by industry for skilled workers, This is on the one hand due to the low enrolment rate of female students in scientific programmes. Moreover, a considerable number of female students enrolled in these programmes drop out early after having started, which leads to the question: How can we adapt scientific programmes, i. e. teaching methods, to the needs of a mixed student body with special focus on female students?

Recent brain and learning research suggests that the classical teaching methodology of introducing a theoretical concept first and demonstrating it on a practical application later should be reversed. Problem based learning is thought to be particularly well suited for female students. However, as soon as you think of practical examples you have to evaluate how these examples address both genders. Typically there are areas in real life which address both genders differently, therefore a special focus has been put on examples which specially address female students. In addition to the overall motivation to improve the general didactics of the course a further motivation was to develop a kind of countermeasure to face the sharp decrease of female enrolments in computer science programmes and to keep at least those females enrolled and reduce drop outs. In other words, “do not scare away those few females, who were bold enough to enrol at all”.

But what does it mean to gender the content of a lecture, and how do you apply it? The field of gender issues in university teaching is a very new discipline. Only few references are available at all and there are no really clear recipes available on how to apply it. However, some few guidelines are known, which are considered already as general standards. For example, any content which might offend any minority or contain any racist, religious or sexual offending matters are not permitted for use in a lecture as reference material. However, it is hard to define where are the borderlines.

More importantly, the following question is of particular interest for this experiment, how do you identify reference material that catches the particular interest of female students. Our own findings and some literature references suggest that using sample material such as project results or reference applications which have been made by female students, might qualify for good examples in this area.

To conduct a first experiment to integrate gendering aspects, we have chosen a first year Computer Science course on “Introduction on Multimedia Sciences” in the Department of Computer Science at Bonn-Rhein-Sieg University of Applied Sciences. Two experienced female graduate students have been hired to revise and restructure the course material and to integrate project results and reference applications made by females where appropriate. In particular, an existing blended learning application has been chosen for use in the course. This course was considered to be specially suited for such an experiment, since this course aims to introduce a very wide and rich application area of Computer Science. Basic technology and terminology are introduced while giving the students a first chance to experiment with several tools in the multimedia domain. Moreover this application area provides the opportunity to include numerous visual and audio stimuli through impressive examples in the lectures. An additional motivation is the recent tendency at the University level to adapt course contents more to the different levels and backgrounds of the students. This is in particular true for first year students. In our experiment, the variety and range of pre-knowledge turned out to be huge, from close to expert down to no knowledge at all since some students have never seen, used or thought about any multimedia application. Reference media, sample applications and former student project results have been taken, updated, improved and incorporated as part of the revised course design and structure. Associated teaching labs have been re-organised and new assignments with new reference material have been developed. Another means to improve the efficiency of teaching was the introduction of the moodle e-learning platform to enhance individual communication between student and instructor as well as facilitate communication amongst students. Despite the psychological barrier and the gender differences in applying these tools, the overall advantage of this platform was obvious.

The evaluation of our experiment has turned out to be hard, since just the course performance of the participating female students might not provide all the required information to evaluate the impact of the changes. One of the major reasons for this is that one prerequisite to allow a comparison of the female performances would be that both pools³ have the same pre-knowledge, which cannot be assumed without prior testing. Moreover, comparisons of the drop out rate and student attendance do not really provide the information we were interested in because they are also influenced by additional external effects. Therefore, the evaluation of the outcomes is based on

the available student's course evaluation data. As points of reference, a course taught by the same instructor 3 years ago and a course taught by a different instructor a year before were used. Ten different questions have to be answered by the students which include a numerical mark followed by the option to provide written comments.

The evaluation of the revised course showed significant improvement of the four main criteria:

1. Coherent presentation of the content
2. Motivation to collaborate and to critically discuss the content
3. Instructor's availability during (non) contact hours
4. Level of the instructor's preparation

Moreover the category of "Supporting media/means" and finally the "Overall judgement" increased significantly. It is important/worth to mention that no change in the student judgement was found in the categories "Opportunities to get actively involved" and "Level of difficulty". This indicates that the content was considered neither more difficult nor easier, which would have had an impact otherwise. A small decrease in the category of "Attendance" was identified, which however was considered to be insignificant and could be interpreted as noise.

To conclude there are some important lessons learned from this experiment. Reviewing the didactics is always good for students regardless of their gender. Students are more motivated and the content is easier to understand. The revised, updated and/or added media have been appreciated and the overall judgement of the instructor increased although this measure is always subjective due to the student evaluation data. The conclusion is that problem based learning has proven (again) to be successful with the teacher and student, regardless of gender specific information, student performance or drop out rates. But what are the gender effects obtained. An important finding we observed during the course was that female students were really interested in the example applications and projects which have been created by female students. Moreover, since teaching labs were co-supervised by the two experienced female students, mentioned before, a clear message was passed over to the female students in class, that females can be successful in Computer Science. In summary, to improve the attractiveness of the content of a lecture, in particular for the female audience, one has to work on good practice examples done by females and supported by good female role models. However, gender issues in university teaching needs more research in the future to identify those aspects which are important.

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IVCS – A CELEBRATION OF LOCAL CULTURE AND DIGITAL LITERACY IN THE VIRTUAL WORLD

Michael Mino

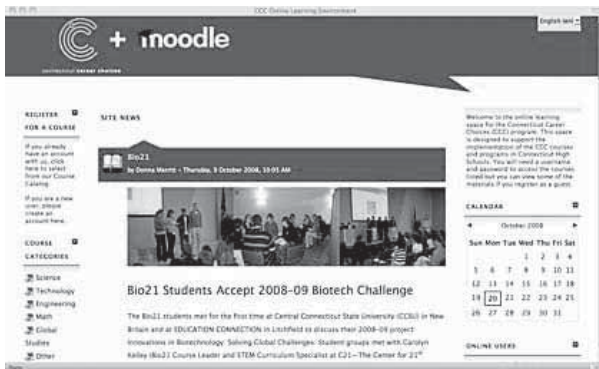
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The Center for 21st Century Skills @ EDUCATION CONNECTION is a United States non-governmental not-for-profit organization based in Litchfield, Connecticut. The Center, in collaboration with the Connecticut Office for Workforce Competitiveness, has leveraged funding from the Connecticut State Department of Education and the National Science Foundation to develop the Connecticut Career Choices (CCC) program. CCC is a workforce development initiative focused on developing 21st century workforce skills in emerging fields of science and technology. With support from statewide partners, CCC has developed, and is implementing, online curriculum and experiential learning opportunities that are setting the groundwork and preparing a workforce ready to meet the demands of 21st century careers. The CCC program has three major elements or “dimensions” that include face-to-face, online, and virtual learning environments.

The First Dimension: CCC currently engages over 1500 urban and suburban students in their local high schools in courses such as Bio21, Digital Media and Movie Making, E-Commerce, and IT Research and Development. CCC courses also connect classroom curriculum to the 21st century Connecticut workplace. Connecting CCC curriculum to experiential learning activities helps students and teachers understand the relationship between the content they learn in the classroom and the skills they will need to



succeed in 21st century careers. Business mentors are working alongside students in the classroom and students are gaining first-hand experience through workplace and university campus visits. Teachers are also gaining a new appreciation and understanding of the business world as they visit these workplaces and host business people in their classrooms as mentors and speakers.



The Second Dimension: In the 21st century classroom, all learning experiences should extend into the online world. CCC Online (see: <http://ctcconline.org>) is an online course environment that uses the Moodle platform to deliver the CCC course content. CCC curricula are designed for use in a “blended learning” environment. Blended learning is the use of an on-

line instructional environment to support learning in a classroom setting. Curriculum materials developed for a blended learning environment include Internet resources as a core component of the teacher and student activities. Students and teachers can utilize the online resources in the classroom or at anytime and anyplace. Online collaboration and communication tools further extend classroom discussion beyond the boundaries of the classroom walls. The World Wide Web and the Internet provide resources and opportunities that must be applied to enhance and extend traditional learning environments.

The Third Dimension: The 21st century advent of fast computers and high-bandwidth Internet connections has spawned the design and development of a variety “virtual worlds.” A virtual world is a computer-based 3-D simulated environment intended for its users to inhabit and interact via avatars. The virtual environment by its very nature is a participatory environment. In order to interact with others, users must create and control an avatar. Users choose the gender, skin color, body shape, and clothing of the avatar and control all aspects of movement of the avatar as it navigates the virtual world and interacts through gestures, voice, and text chat. Many open and proprietary



virtual environments such as Active Worlds, Club Penguin™, Croquet, Google Lively, Second Life®, and Webkinz currently exist and are used by kids and adults for a variety of entertainment and work/ education-related activities. The most popular environment, when gauged by the number of active users, is Second Life for those over 18 years of age and Teen Second Life for those from 14–17 years

of age. Second Life boasts hundreds of thousands of visits and millions of U.S. dollars transacted monthly.

A number of major corporations are engaged in developing and using virtual environments as part of their business productivity and marketing strategies. Two companies of note are Sun Microsystems and IBM. Sun has developed an open-licensed platform called Wonderland. Wonderland was initially developed as a means to more effectively connect Sun's telecommuting workforce in a more engaging and productive manner than traditional teleconference or Web-based technologies. IBM, by contrast, has developed an extensive Second Life environment for both customers and employees who interact and conduct business daily at the IBM Business Center in Second Life.

The largest educational presence in Second Life is the New Media Consortium (NMC) Campus. The NMC's Campus in Second Life, launched under the banner of the Educational Gaming Initiative and with initial support from the MacArthur Foundation, has evolved into the largest educational presence in that virtual world, occupying the virtual equivalent of more than 2000 acres. The campus is growing steadily as NMC member institutions add their efforts to ours in creating a state-of-the-art 3-D virtual laboratory for NMC member institutions and their faculty. The effort, which began in January 2006, has fostered a growing in-world community that numbers in the thousands, and supports an ongoing series of events, classes, demonstration projects, art exhibitions, learning experiences, and more.

Our Center has an online virtual collaboration environment in Teen Second Life called the International Virtual Collaboration Space (IVCS). IVCS is a custom-designed environment for teens that was created in collaboration with the New Media Consortium and designed for use by CCC students and teachers. We now propose to develop and host the IVCS-UNESCO Digi-Media Festival: A Celebration of Local Culture and Digital Literacy in the Virtual World. Together with our UN affiliated partners, we will use IVCS to bring together students from around the world to explore common interests and develop cultural understanding through an ongoing series of digital media festivals. The students will identify universal themes, digital media formats, and evaluation criteria for festival submissions. The students will oversee collaborative evaluation with festival participants through both a jury and a popular voting system. The IVCS-UNESCO Digi-Media Festival will celebrate local culture, inspire outstanding youth-generated media, and demonstrate digital literacy in both the real and virtual worlds.

HOW THE INFORMATION SOCIETY WILL DIVIDE?

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The information society strategies world wide emphasize e-services of all kinds in the future. That gives new demands of basic skills for all citizens of the information society. The equality of all citizens is threatened. When the new services are delivered equally through the Internet the only possibility is to use mobile solutions. The big challenge then is to provide all citizens the required skills and competences.

The digital gap is increasing between youth, the Y generation, and the older generation. The term Generation Y refers to the social group born between 1985 and 2000 and comprises over twenty percent of the population of many western countries, including the US, UK and Australia. Generation Y displays markedly different characteristics to the Generation X (those born from approximately 1961 to 1979) population which preceded it. Generation Y students will undertake secondary education this decade. Increasingly, the use of mobile ICT is defining the social interactions of this group at the time they are entering into secondary education.

The Y generation will achieve sufficient skills of the information society in the institutions of formal, non-formal as well as informal learning before adulthood. The role of use of ICT and media education has been increasing in the schools. The Y generation grow up in the digital media culture and receive instructional guidance according to curricula.

The challenge is to provide needed skills and competences to people who are now in working-life, aged, or outside the learning institutions. This article is designed to contribute to understand how to help the citizens to face the present and future challenges and to respond to the challenges of extending the concept of media literacy to include the digital citizen skills and competences needed now and in the future.

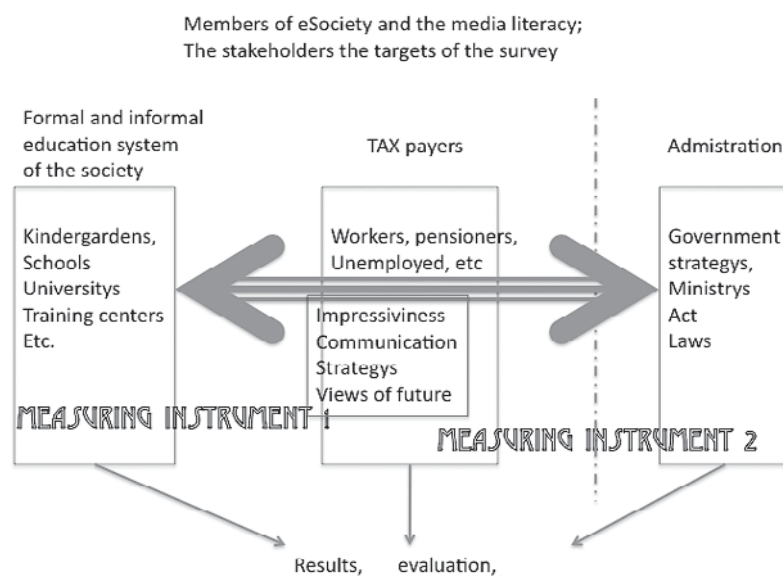
The method is design measure built on three pillars: 1. Formal education, 2. Users (European citizen), 3. Administration. The first face is to survey the level of curriculums in the formal school system. The objective is to find out what basic skills and competences are given in the schools for pupils. The cultural and local examples of good practises of training ought to be collected.

The second task is to design the measurement process so that it gives comparative data of the plans, strategies, and visions of the administration. It is vital to compare

the development of the information society to the basic skills and competences given in the school system.

The third task is to identify and define the digital gap between the Y generation and the adult population. What kind of means already in use and practice or under development can be utilized for the adult population to respond to the challenges of the information society. The study will explore the good practices in the school systems for possible scaling and wider utilization. The role of the third sector will also be examined.

This measurement system and development process is easily adapted and implemented in different countries or educational systems.



BUILDING ARAB SOFTWARE INDUSTRY: AN EXPANSION OF THE INDIAN MODEL

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The volume of the global software industry is huge; the total SW revenue is in hundreds of billions of dollars annually. According to many sources like the Datamonitor reports, it forecasts that the SW revenue will continue to increase annually as a result of the continuous global demands for the software products. This increase of the SW products sales will continue to generate an enormous wealth for those who are involved in this industry. Although, the SW industry generates these enormous revenues, the overall investments to create this industry are considered to be relatively very small compared to the investments to create other industries like oil and gas, manufacturing, or processing. This small investment feature allowed many transition economies to create successful SW industry in the past; good examples are India, Russia, Philippines, and Malaysia...etc

To take the Indian model as an example of the early entrants to this industry, the Indians became involved in the SW industry back in the 60's and 70's. The volume of Indian software exports didn't exceed half a million back in 1990, but this figure increased tremendously in the following ten years to reach \$ 5.9 billions in the year 2000-01. The next five or six years, the Indian SW products recorded a total revenue of \$ 23.6 billions and this figure is expected to reach \$ 60 billions in the year 2010. This great success of the Indian model raises many questions about the reasons that lead a country like India to reach this level of development in the SW industry. But with a closer look into the Indian SW industry, it will obviously appear that the collaboration between the different sectors of the Indian economy along with the government involvement, were the main reasons for this success. The Indian government took major steps that help the SW industry to flourish and succeed. For example, the Indian government encouraged the establishments of the educational institutions that were able to produce the skilled technological graduates who formed the workforce that was required for the SW industry. On the other hand, the Indian government encouraged the SW industry by reducing the taxation on the industry on one end and by eliminating other barriers that may slow that industry on the other end. Other factors that helped the Indians to create this successful industry are related to interrelationship among the scientists in India and the Indian scientists who lived abroad. This type of

relationship created channels of communications and the transformation of specific information about the markets demands in both the United States and Europe; the largest two SW markets in the globe.

This was an example of an early entrant to the SW industry; namely the Indian model. But other late entrants like the Russians proved to be successful even though their SW industry came at least ten years later than the Indians.

The Russian SW industry is expected to reach \$ 2.0 billion dollars by the year 2010. Despite the obstacles the Russian SW industry faced back in the 1990's, the Russians were able to pull out and get into the SW industry competition. Like the Indians, the Russians focused on the international markets' demands to create their software industry. Like the Indians also, the Russians adopted the strategy of collaboration among the different sectors of the economy and relied on the government support to legally protect and financially help their promising industry.

The above two examples give many countries in the world an inspiration to think seriously to create national software industries; and the Arab world is not an exception. Actually the Arab countries especially those that are oil production countries have higher chances to faster create this kind of industry for the following reasons:

1. The existence of huge capital-oil and gas revenues- necessary to create the SW industry.
2. The existence of the local markets demands (oil and gas industry) that need enormous sources of software products, which are necessary for the oil and gas industry.
3. The existence of advanced educational and technological institutions that are spread all over the Arab countries. Those institutions are able to produce the skilled graduates who will be the workforce for the industry.
4. The existence of other factors that can help the creation of the industry such as: the existence of the local SW industries like the ones in Egypt, Tunisia, Lebanon that can provide the assistance for the training and the educating of the young graduates.

All these factors with the commitments from all who need to be involved in this industry, will give the Arabs the greatest chances to create their own SW industry. The key success factor that we must learn from other successful models (the Indian and the Russian) is the collaboration and the hard work from all Arab economy sectors and with the serious involvement from the Arab government, by then the Arabs can build their own SW industry.

THE ALLIANCE OF CIVILIZATIONS IN THE FOREIGN POLICY CONTEXT: THE CASE OF RUSSIA

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My presentation discusses The Alliance of Civilizations (AoC) in the context of the Russian discourse on ‘civilization’ and in connection with the country’s foreign and security policy. In particular, I examine the relations with the Muslim world on Russia’s southern borders, i.e. the Caucasus and Central Asia. My point of departure is the idea that ‘peace thinking’ and foreign and security policies need not be considered altogether – a priori – different tracks of thought and action (as the human level vs. state-centered discourse, for example), but can be mutually complementary and examined as variations of a practical scheme of action.

In conclusion, I have six points:

1. The focus on ‘civilization’ fits well together with the tradition of Eurasianism and the foreign policy launched by Putin. Neo-Eurasianism argues that Russia’s geographic location between Europe and Asia gives it a distinct identity akin to ‘civilization’. In the diplomatic context of the UN, the civilizational alliance refers to the political coalition of Russia (the CIS group led by Russia) with China and India to form a counterforce to the hegemonic power of the US in world politics.
2. The Russian interpretation of the AoC emphasizes a cautious, piecemeal approach to modernization. Russia has learned from its own radical approaches and underlines the distance it wants to take from the Soviet past. Afghanistan was a milestone. In Russia, the AoC is a part of this discourse, which also criticizes the US policies to make Iraq a platform of modernization. More specifically, the AoC supports the modernizing approach, which is focused on the development of human resources in the CIS area and, in this way, the creation of social interdependencies between Russia and the other countries. Education is a special emphasis. An example of the coordinating efforts is the forum of

the CIS intelligentsia for the arts and the sciences, which has functioned since 2006. Integration in the social dimension is linked with diaspora policies, which were initiated in the early 1990s.

3. The operative space of the AoC depends on civil-military relations, which can be studied by comparing the relative weight of the Ministry of Defense (MoD) and the Ministry for Foreign Affairs (MID) in the policy process. The Putin regime has diminished the role of the MoD and incorporated the military staff directly in the formal policy process. The sustained success of holding the military under political control depends on the external threats. These, in any country, strengthen the powers of the military in the domestic arena.
4. The treaties of friendship between Russia and the newly formed mini-states of Abkhazia and South Ossetia implement Russia's goals in the process of regional integration. The logic of the process works by separation (formal sovereignty) and integration (military, economic, and social).
5. In times of war and conflict, the purpose of the type of discourse represented by the AoC is to maintain the fabrics of human relations, i.e. to support the argument that war and conflict are not 'ethnic', for example, but relate to rivalries of political power. Although this bifurcation diminishes the powers of the type of discourse represented by the AoC it, at least, keeps it alive and functions to prevent the polarization of the conflict. Unlike in the Balkans, in South Ossetia and Abkhazia the conflict has not been ethnically constructed. This is a sign of success of the humanist discourse, although it also, in some cases, connects with political instrumentality.
6. In the world political context, the Russian policy goals in its southern borders are realist in the sense of *Realpolitik*. This means that the issue at stake is about the *agreement about rules*, legal rules and political practices, in the sense which recognizes the interests of major players in world politics.

MULTI-LITERACIES IN TECHNOLOGICALLY MEDIATED INTER-CULTURAL COMMUNICATION

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In our presentation we are investigating the area of intercultural communication and use of emerging ICT practices in learning, knowledge sharing process and education. Finland is among the top countries with developed information society and Russia, being the biggest country in the world, is far from this position. We would seek the answer to the question in what way could the knowledge flow be organized in order to decrease the gap between these countries in media application during the learning process. The start for this research and projects grew out of the tremendous interest of Taganrog State University of Radio Engineering (TSURE) in international cooperation with Finnish academic circles and the initial request, addressed to one of the authors, to organize the seminar dealing with the contemporary problems and developments in the European education and uses of technology in it.

The first seminar was held in December 2004 via video conferencing technology from the University of Tampere to TSURE, which as educational institution has over 50 years of excellent history and tradition in educating. Its numerous research units employ the latest technology and the graduates are considered to be among the top professionals. The distinguished speaker professor Tapio Varis held a two-hour long speech entitled “University in the 21st century and learning in multicultural context”, which was followed by another hour open for discussion and questions. The event, first of its kind for TSURE, was a great success, well-received in the university by students, faculty members and by the administration. The results and outcomes of the single seminar and its importance in the local community level were presented at the international Media skills and competence conference in May 2005 in Tampere.

Realizing how different the situations and possibilities of students are in two different educational systems of Finland and Russia, we became interested in the question of how could the knowledge be delivered to the Russian students of selected university by means of the technology if the mobility was out of question at that time – there are no bilateral agreements between southern educational institutions and Finnish universities and neither the funding for the exchange programs available to students

for spending semester or two in the European universities. Though that doesn't mean that Russian students have no passion for the experience of education systems and knowledge from abroad, which became evident after Department of Linguistic Education has requested to have another video seminar organized at the end of 2005. This time professor Varis was invited to speak on the topic of "E-Learning and corporate competences", touching in his speech areas of great interest – critical thinking in media perceiving, taking action and involving yourself with the blogs and wikis as part of active citizenship, life-long learning and constant need for new competences and skills in the work-related environment. The time for discussion had to be extended due to the number of questions and opinion points from the audience.

The efforts of organizers were highly appreciated and created the grounds for the future cooperation between Finnish academia and TSURE. Conditioned by the situation of Bologna process and merger proposal, TSURE was in search of direction at that time. Well structured presentation and clear slides helped to deliver information in a simple way and brought through a lot of ideas, helping to visualize the direction where the Russian university should head in the nearest future.

In our research we are concentrating on the search for the ways in which technology could be used to build the understanding and cross-cultural communication for knowledge sharing in the sphere of education. Research includes networking, information gathering and analyzing, close cooperation with the interested educational institution in order to work out the details of practical implementation of intercultural educational projects.

Taking into account the stunning difference of the university level education systems in two countries in question, we are working out theoretically and exploring in practice experimental and innovative ways to deliver knowledge to Russian students of different disciplinary backgrounds, dealing with the questions of academic freedom and motivation techniques in the education process. We would like to note that a critical aspect of our research is not only searching for the ways of developing innovative education techniques or adapting those that already are in use in Europe and the rest of the world, but still realizing the significance of the centuries of traditional Russian methods of educating. Significant part of the work is devoted to forming media competence of students in the context of existing Russian educational system. The research seeks to suggest how to bring up the level of education by introducing critical thinking concept and forming media and digital competences at the early stage of students' education in university, if it wasn't already formed during the years of middle and high school education. We also stress the importance of realizing the global situation, which university graduates are facing after finishing their formal education, as well as and relevance of life-long learning concept due to

ever-changing environment of work and demand for constantly acquiring new competences and skills to meet the requirements of the employer.

As one of the outcomes of a long-term research we would like to present the course, which was designed taking into account most of the points stated above. It was organized for the students of Linguistic Education department of TSURE via video-conferencing technology during the spring term of 2006. This course was developed in a close cooperation between the faculty members of LE department and the distinguished professionals in the spheres of media education, technology and culture. First time the course offered to students was developed with partners abroad, and still became the part of official university curriculum, bringing the grade for this course into the transcript of studies of the participating students. We're going to elaborate on the organizational matters and impact of this experience on the different levels – community, university, department and students.

ICT BASED EDUCATION FOR CULTURAL LITERACY?

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Cultural literacy discusses communicational competences. The concept of “cultural literacy” has first been defined by E. D. Hirsch Jr. in 1987. Hirsch redefined literacy as being dependent on the specific information that is taken granted in the specific discourse. Thus, reading and writing is not only based on en- and decoding words but equally involves the whole process that comprises concepts behind words. (Hirsch et al., 2002)

This definition of cultural literacy is static and results in listing all concepts that a cultural literate person needs to know. But such static knowledge is not sufficient in our fast changing world that equally needs intercultural competences.

For this reason we propose a dynamic definition of cultural literacy that is based on a basic body of knowledge as well as on competences required to deepen this knowledge and gather and use new information. In this paper we present required competences and discuss how these can be fostered using ICT in education. Focusing on these competences will not only change the content of education but has impact on the way of education.

The main competences required for cultural literacy are:

- The identification of relevant concepts among a multitude of not yet known concepts and ideas as well as
- The comprehension and apprehension of the concepts

These competences are equally relevant for acting as mature citizens in today’s information society. They are closely related to information handling and communication and should be trained and fostered in different settings throughout the whole education. The access to ICT enables different ICT based educational settings that help developing the required competences.

Those settings can train students for information research and help to create their awareness for information quality. This enables students to evaluate information and to gather new relevant information whenever required, i.e. to enhance their knowledge base. Different settings can also be used to expose students to communication situa-

tions that are prone to misunderstanding increasing students' awareness of the different concepts behind the same terms used by communication peers. Such misunderstandings can only be resolved if communication peers adapt their knowledge base.

The proposed educational settings depend on enabling factors. Among them are the teachers, whose role changes towards learning moderators and coaches. Local content in different languages is relevant for using the Internet as information base for educational settings in different countries. Efforts are required to enhance the locally available content in some regions. The students need the competence of critical thinking which cannot just be trained in short sessions but must be encouraged and fostered throughout the whole education. This might require the re-design of complete school curricula.

Schools can act as enablers but cultural literacy requires life long learning of everybody. This re-defines the role of schools as centers of conveying knowledge and "training centers" for information research having as one goal to make the students become as independent from the teacher as possible so that they can direct their own learning themselves.

ICT can not only change the role of schools, the ways we teach and the competences our students learn – ICT should change them to help us prepare the new generation to actively take over their role and responsibilities in the complex and ever changing world of today. Such changes cannot occur from one day to another and we need to experience different didactical methods and validate and refine curricula changes. We are still in the process of change.

We hope that an enduring discussion among the participants of the workshop might start and that reflections, research and projects will evolve for the improvement of the education of our students. Continuous exchange of experiences in new educational methods as well as of teaching materials may act as promoters of cultural literacy. ICT offers great chances to the education for future generations, but we need to adapt learning content and learning outcomes as well as the way we teach and learn. In doing so we really can profit from ICT based education to enhance cultural literacy.

References:

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SETTING UP UNESCO-UNEVOC CENTER IN SAINT-PETERSBURG

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The Unesco-Unevoc Center of Saint-Petersburg is hosted by the Saint-Petersburg State University of Information Technologies, Mechanics and Optics (University ITMO). This defines institutional context for the profile and activities of the Saint-Petersburg Unesco-Unevoc Center.

The University ITMO is a leading Russian school in Information and Optics Technologies. Currently the University ITMO provides educational services, at both undergraduate and postgraduate level, in approximately 35 specializations related to Information and Computer Technologies, Computer Science, Optical Engineering, Physical Engineering, Optical Technologies etc. The University ITMO has a considerable size with more than 10,000 students and 2,000 teachers, researches and other staff members. The Program of Doctoral Studies of the University ITMO is also sizeable, with more than one hundred PhD theses successfully prepared within the last three years. Within the last two years the University ITMO has been rebuilding itself as an Innovation University. For this purpose the Ministry of Science and Education of Russian Federation, and in the framework of a special program, has granted to the University about EUR 18 million to be spent in the period 2006–2008.

The University ITMO is a full member of the European University Association (EUA), which is the main agent in consolidating and building the European Higher Education Area. The University was the first, and so far the only, university in Russia, which went through the Institutional Evaluation Programme conducted by a team of top experts appointed by the EUA. The audit conducted, as this is reflected in the official Evaluation Report, has confirmed that the University ITMO is well-run innovation university.

At the University ITMO the instruments of Bologna process are fully implemented. The University has adopted ECTS system and uses standard forms of Transcript of Records and Learning Agreement. The Bachelor program at the University weighs 240 ECTS units and lasts four years, while Master's is 120 ECTS and takes 2 years

The profile of the University ITMO to the great extent defines the activities of the Unesco-Unevoc Center of Saint-Petersburg (U-U-SPb), which focuses on enhancing regional Sustainable Development through developing and supporting high-tech innovation activities and on the basis of small and medium size enterprises, in particular.

In this connection, the U-U-SPb Center emphasizes regional cross-border collabo-

ration through building a network of regional Unesco-Unevoc Centers and with the Unesco-Unevoc Center in Tampere, Finland, in particular.

The projects portfolio of the U-U-SPb Center contains currently, among other activities, two projects funded by the Finnish Ministry of Foreign Affairs:

- 'A Feasibility Study for Building Business Innovation Capacity – Current State Analysis of the Small and Medium-Sized Enterprises in the St. Petersburg Area 2008 – 2009'
- 'Implementing Web Based Teaching Methods and Practices for Distance Learning in Finnish – Russian Intercultural Master's Programme 2008-2009 (DL)'.

These activities are in line with the main mission of the U-U-SPb Center, which is development of technical and vocational training and through international programs, as well.

LIFE CHANCES, LIFE CHOICES, LIFE SKILLS: FROM MULTI-CULTURAL LITERACY TO WORLD CITIZENSHIP

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Summary: Life chances and life choices are significantly lower for people who are ICT-illiterate, since to have access to the benefits of ICT, they will need to use competent intermediaries. As research at Nokia has shown (eg by Jan Chipchase and his group), there are ICT equivalents for ICT-illiterates of the communication practices developed by illiterate people, for example involving delegation or work-arounds or non-disclosure of their difficulties. Even basic ICT literacy is far from global. The gap between the ICT-illiterate and people at the forefront of adopting ICT advances is widening rapidly and could become the cultural equivalent of stone age tribes co-existing with citizens of the developed West. The nature of literacy and illiteracy is changing. Pre-ICT education was often focused on narrowly-defined needs: eg, national culture, rather than multi-cultural needs. The resulting learning was like a Swiss Army Knife, with many elements that were acquired “Just-in-case”; might never be used; were not optimal for any single task; needed thought before they could be safely applied to other contexts or cultures. All of this could change with the advent of ubiquitous ICT. Trends in that direction include massive growth in the number of people who now have mobile phones; the increased availability of converged devices; the near-universality of wireless broadband; the proliferation of innovation; the emergence of widespread mobile access to the internet; and the growing importance of context rather than content.

The increased connectedness of our world is making it possible to tap into new forms of literacy (eg citizen journalism using mobile phones), to make news (as with video-recordings of protests by Edward Said), to give lectures that are recorded informally by audiences then widely shared on YouTube; and to influence leaders over a period of years (as with the high-value Good Governance awards offered by Mo Ibrahim).

An imagined pattern of using Ubiquitous ICT is that crowds of users upgrade to “ubiquitous ICT” devices that are cheap or free to use & work everywhere, fast; they join social media communities; they recommend them to friends; they consume content supplied by others; they move to creating and sharing content; they know where their friends are, what they’re doing; they become early adopters of new tools and advocate them to others. The reality is that ICT allows views and news to spread fast

– with unpredictable effects. For example, at the time of SECL, rumours of US financial difficulties were causing stockmarket sentiment to fluctuate wildly. As one pundit (John Gray) put it, “Outside the United States, most people have long accepted that the development of new economies that goes with globalization will undermine the country’s central position in the world. They imagined that this would be a change in the United States’ comparative standing, taking place incrementally over several decades or generations. Today, that looks an increasingly unrealistic assumption. Having created the conditions that produced history’s biggest bubble, U.S. political leaders appear unable to grasp the magnitude of the dangers the country now faces. Mired in their rancorous culture wars and squabbling among themselves, they seem oblivious to the fact that U.S. global leadership is fast ebbing away.” (John Gray, October 2008: <http://www.theglobeandmail.com/servlet/story/RTGAM.20080930.wcogray01/BNStory/specialComment/home>).

Being ICT-illiterate is making some people depressed: [Associated with the take-up of new media,] “...we see a lot of phobias and depressions, ... to do with lack of knowing how to operate in the world, poor problems solving skills, fearfulness of even mild risk taking and an inability to form healthy relationships due to suspiciousness... One of the problems of self-construction through media for these people is they do not have the skills to take advantage of the opportunities presented and become a sort of “ghost” population that it is difficult to motivate and fearful of engaging... People who have the social and intellectual skills to truly define themselves are in a good position.” (Alan Moore, April 11, 2007: “The issue of self-identity in a post-modern world”, <http://www.typepad.com/t/trackback/308749/17625590>).

It is too-often forgotten that rich-world and poor-world ICT users co-exist. Yet visual reminders of this are all around us. That point was brought home in an award-winning advertisement showing some locals at a beach in the developing world, photographed under the surface of the sea, at the same time as a developed-world surfer skimmed above them. (Dustin Humphrey, http://blog.photoshelter.com/image/JASONAPPARICIO_THE_JAMAICAN_SURF_TEAM_POSTER.jpg). One question that highlights this is “How can we go beyond rich-world users and gather results for the next billions, the better to understand the needs of others, and how they work around lack of resources, and to anchor to those needs and realities, and so meet them better.” An answer is to follow the practices of Nokia’s Jan Chipchase: Listen, Innovate, Get Feedback, during thoughtful field research into the daily realities of poor people, and thereby to focus on meeting real needs in ways that “maximize delight, minimize regret”.

ICT-rich and ICT-poor life chances and choices can become dramatically different in a short time, as we see in the experiences of the new black African middle classes in post-apartheid Soweto, compared with the experiences of the newly-poor white Af-

ricans in the same place. ICT literacy can help people to become ICT World Citizens – able to use ICT to make a difference, everywhere, from anywhere. The possibilities that ICT offers there include: a mash of today’s mobile media and social entrepreneurship; moving from “life-style”, to “life-chance” to “life change”; and extending user-generated content to help poor people and their communities to get access to help, maybe beyond their dreams and their experience, such as low-interest or no-interest loans of money and other resources; mentors, supporters, protectors, volunteers; stories to share, local knowledge, useful contacts; and other kinds of knowledge, eg how people live elsewhere, how to improve their and your life chances and choices, how to innovate, how to be an entrepreneur. So in a sense, ubiquitous ICT is a communication channel: Each of us can become a concerned World Citizen; we can use phones for citizen journalism; we can publicize good behaviour and help it to be rewarded; we can “blow the whistle” on bad behaviour so that it is uncovered fast enough to halt its spread and to bring criminals to justice quickly. This can lead to major influences, as with the move to reward African leaders who exhibit good behaviour: “In 2007, Mo Ibrahim, a 60-year-old Sudanese-born billionaire who made his money in the cellphone business, announced ... what he called the world’s biggest individual prize; \$5 million... for the sub-Saharan African president who on leaving office has demonstrated the greatest commitment to democracy and good governance... Eligible candidates,” the prize rules insist, “will have taken office through proper elections and left having served the constitutional term stipulated when taking office.”

(<http://www.usafricaonline.com/africaprize.moibrahim06.html>)

Joaquim Chissano, the former President of Mozambique, was eligible and became the inaugural Ibrahim Laureate. “Though he was well-liked and his country continued along a path of progress, Chissano announced that he would not run for the final five-year term the Constitution allowed him in 2004. His decision shocked many, for African leaders have a history of holding fast to their offices.”

(<http://www.answers.com/topic/joaquim-chissano-1>)

GAP ANALYZE – ELEARNING CHALLENGES

Marja-Riitta Ritanoro, Kalle Hedlund, Alamandar Khan

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MKFC Stockholm College will describe how the End- To- End eLearning™ method is working in Somalia, Somaliland to meet Teacher Training challenges in Africa. The other cases are Community Action Plan in Pakistan and Diaspora courses in developing world.

TEACHER TRAINING

There is a shortage of teachers in the world, Europe, Africa, Asian and in Arabic Countries. Since Colleges, High Schools and Universities aren't able to educate enough to meet the needs of these continents MKFC wanted to find and have found new ways and new places for teacher training.

GOALS FOR THE STRATEGY

To Reshape Teacher Training (TT) for teachers who work as teachers

- Integrate Primary and Secondary schools Teacher Training with working life
- Decrease the cost of TT
- Create Equal One Standard for TT
- Prevent Brain Drain
- eTeacher Training for One Standard

After eight years of practical implementing MKFC believe and have evidence that End- To- End eLearning™ is the most powerful tool to educate persons who have been excluded from education.

MKFC Stockholm College created End- To- End eLearning™ in the year of 2000. The goals were to extend and modernize the access and educational methods.

There are internationally many forms of eLearning better and worse ones. MKFC reshaped every part of eLearning process to make good changes happen. The most important decision was to ask “how learners learn “. Answers created the new paradigm, the old one was to ask “How to teach “. Next step was to take the best international practice, embed it with local roots and implement theories in authentic environments. Third decision was to choose the content, add assignments supporting the Action Learning method, embed digital course books, offer tutoring and net communities for extended communication outside the individual school.

MKFC designed and practice today End-to-End- eLearning™: “Everyone is included, All the time , Every Where , Every Content “.

Results gave better quality, new transparency, better accessibility, decreasing cost, higher put trough, and working life experiences embedded in the learning process opening the work market.

Broadband? End-to-End eLearning™ offers different channels in different situations: satellites, CD s, USB, memory cards, and so on, besides the ground pillar learning platform (LMS)”.

The missing broadband cannot stop eLearning even if it can make the process easier.

CASE SOMALIA INTEGRATION TEACHER TRAINING WITH WORKING LIFE

The End- to- End eLearning model was made as a ground pillar for knowledge building for Teacher Training (TT) in Al-Baraka Elementary Intermediate and Secondary Schools in Somaliland 2008 provided for 14 students. Offering the Teacher Training at work teachers were able to continue at the school, study and implement assignments in own lessons. This approach benefits the pupils and the school, too.

All content can be printed and the only one Internet connected computer with a web browser and a text editor is needed. MKFC sent even to all teachers thru “normal mail” CD s.

The Teacher Training in Somalia is based on the British curriculum and has been developed by MKFC to suite an authentic Action learning method. In the Action learning the teacher is coaching pupils with actions tasks to make a research of subjects (Environment : Ask your family how the climate was before and now). Pupils report results to the peers, the teacher and even to the eCommunity.

This method gives better learning results for the pupils and for the teachers. Long term research shows that Action Learning method make the students to Life Long Learners. In their future professions they always wanted to learn more. This sustainability is needed in our knowledge society. TT -course MKFC have tutors who are eTT experts and bilingual. The cost is for Sweden less than two half time tutors, Skype conferences and some stamps to send CDs. For Somalia the learning time uses mostly to make research with pupils. The assignments sent to Swedish tutors are even taking part of international network within Environment awareness. The environment cooperation include 106 countries with over 600 schools. Participating in net communities is to open windows to best practices and creates a global understanding even for a rural school in Somaliland.

DECREASE THE COST – STOP BRAIN DRAIN

All African countries suffer from brain drain because the gifted talented are going abroad or leaving the profession often even before the education is over. By providing eTeacher Training we can work against a brain drain because the cost for the students are lower than on campus.

End-to-End eLearning™ has reduced the education costs to 25% compared to the costs of traditional learning. At the same time the quality has been better with 95% output with amazing practical changes.

Students have access to the course material and books are included in the learning platform with no extra cost. When the material is created as small clouds they can always be reused, reshaped for new tasks .

PAKISTAN COMMUNITY STEP BY STEP ACTION PLAN

ICT has a critical role in socio-economic development and can be used to deliver education materials through other actors from on line.

MKFC started Community Step By Step Action plan efforts at grassroots level in Pakistan 2007. MKFC mapped first the country to the NGO request in Pakistan with vaccination tasks. MKFCs teachers created education to support sustainable development in rural areas in Peshawar Pakistan.

MKFC created to eLearning platform Step-by-Step Actions plan. The plan was to discuss with the elders and the community what has happened in the area of Vaccination, Sanitation, Clear Water, Children's and Women's Illnesses and what kind of Goals the community has. The community decides how and who can take part of action in order to better lives for citizens. Different learning packages created to working groups. A lot of the people are illiterate. By using the latest ICT tools we developed contents even consisting of pictorial descriptive story telling cards, which could be easily understandable for illiterate people, too. The people got information and knowledge about health care, sanitation, nutrition and so on. The micro credit system was embedded for the sustainable development of sanitation and water supplies that created.

1 000 DIASPORA PROJECTS IN AFRICA

Diaspora students mostly with origin in Eritrea, Ethiopia, Kenya and Tanzania use End- To- End Learning™ for their big scale projects including farming, food production, health care, children care , building up small enterprises, ICT centres, industries and eTeacher Training. Until today about 1 000 students have realized, built, innovated and empowered their ideas and dreams in Developing Countries Studies.

In the course the student defines a project idea with the help of peers and a tutor from MKFC. A mapping about the country and region regarding the project fol-

lows. The student integrates and studies the Millennium Development Goals (MDGs), Agenda 21, Development Work, Poverty reduction and Human Rights and local knowledge they need. Once abroad, the student implement theories and work with the project with help from the MKFC tutor and other experts on the net. Every project follows up thru documentation with digital cameras, mobiles, Blog and Skype or other Videoconferences. Networking is always included it is one of the basic idea not only to work together but also to share the results.

END-TO-END ELEARNING™ FOR CHANGE MAKERS

End- To- End eLearning™ starts with the learners or the organizations inquiries relevant to their own needs. End- To- End Learning™ matches as closely as possible with the situations in the real world. In the learning process learners are empowered to make changes, as individuals or groups, starting from the problems that affect them in their authentic environment. The process is created on theories, visions, facts and actual work and practice. The learners or the communities' dreams and visions are the starting point and eLearning gives them possibilities to realize them.

Our partners are governments, agents at local level, stakeholders such as UN agencies, NGOs and other civil society institutions, as well as the private sector and higher education institutions. We also use "Learning Brokers" who serves as the bridge between the global best practices and local needs. Their task is continuing mapping and rebuilding a flexible portfolio of education to meet the local needs.

MKFC STOCKHOLM COLLEGE SUPPORT INCLUSIVE LEARNING

MKFC Stockholm Colleges Education Movements profile is based on the Millennium Development Goals (MDGs).

We support grassroots movements for sustainable changes. Participants are the Change Makers. They realizes, build up and innovate their ideas by Nobel price winner Amartya Sen "Capability approach".

MKFC Stockholm College is from Sweden with a branch in Finland and origins from the Nordic inclusive education system. Education in Nordic European countries are free and include all age groups and education levels. MKFC belongs to a popular adult education movement designed by grassroots movements and supported by state funds. The Nordic education tradition has supported MKFC to design a roadmap to create inclusive, sustainable development and economic growth driven by education.

Since MKFC has reduced own costs and increased the quality we are able to provide education to developing countries with very low fees.

ICT BASED UNIVERSITY FOR E-SKILLS DEVELOPMENT IN RURAL BANGLADESH

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Bangladesh is a developing country with highest population density in the South Asia. The country is rich in natural including mineral resources but people are poor. The reasons of poverty are lack of awareness, education, techno-scientific knowledge, research opportunities and lack of coordination among scientists, technologists, researchers and decision makers. University is the best platform for human skills development and ICT is the best tool for all pervasive developments. Realizing the importance, the Association for Advancement of Information Technology (AAIT) established an ICT-based university in the rural atmosphere of Bangladesh with the name 'University of Association for Advancement of Information Technology' (UAAIT) that started academic activities in 2003 with nine departments under three faculties. The courses for the university were designed in cooperation of global colleagues and ICT experts.

AAIT embarked on a project to upgrade life style of people living in a remote river island of Bangladesh through e-skills development who are deprived of modern facilities. The region's remoteness and surrounding riverbeds means that basic infrastructure does not exist. Drinking water is also contaminated with arsenic. Despite the challenges that children in the island face for survival, they are thirsty to learn, to know, to innovate, to discover and to acquire knowledge about the world. Before embarking on project activities, 112 women scientists, technologists, researchers, medical doctors, policy makers and social workers were trained on ICT applications. The purpose of training women professionals was to utilize their vast knowledge resources for solving community problems and to develop the targeted communities in education, health, poverty eradication and other sectors identified by trained experts in cooperation of community people who are rich in indigenous, traditional and local knowledge.

A community primary, junior high, vocational school, post office and resource centre established by AAIT in the circular shaped river island of 20 sq. kms enabled the trained professionals to bring a significant change in respective fields under the auspices of the University of AAIT. Contribution from the Commonwealth Science Council (CSC) and the ministry of science and ICT (govt. of Bangladesh) as financial

and logistic support, and follow up by the CSC, ministry and AAIT led the project to create a success story in the ICT world.

In evaluation of the rural based project at different stages, it is difficult to say that the overall activities were very smooth. It is better to comment as the better place for learning. Rural project areas can be compared with battle fields. Very few people in the rural community take the project activities in the easy way. They are resistant to change their traditional ways of living. Local youths have lots of support in e-skills development. They try to develop awareness on benefits of ICT and e-skills among the community people. The local members of the governing body of the university (UAAIT) are not aware enough about the importance of infrastructures needed for an ICT based university. They need to understand the technological problems and requirements. It is even difficult to make them understand that technology is not one time proposition rather it is a continuous process.

Medical doctors were initially resistant to learning new technology arguing that participation in such programme would be a waste of time—a pen, piece of paper, thermometer and stethoscope being sufficient tools for their profession. After training, they commented that all doctors and health-related professionals must have ICT and e-skills trainings. Based on their participation, the number of telemedicine projects is increasing day by day. The courses have also led to the beginning of a team of doctors, educationists and tele-workers empowered to implement tele-medicine, tele-health care, tele-education and tele-design across Bangladesh.

Throughout the world, a key determinant in the development process is the ability of communities to access and control resources and technologies for improving their well-being. Technology must be socially, culturally, environmentally and economically sustainable. The health, housing, employment and economic development aspirations of people in developing communities are dependent in a large part on their ability to access, control and sustain the technologies that deliver the anticipated benefits.

Bangladesh is globally known for its environmental significance being world largest delta, containing world highest population density, longest sea beach, largest mangrove forest, thickest sedimentary deposition and extreme proneness to disasters such as floods and cyclones. Most part of this vulnerable country is facing the catastrophic but silent disaster with arsenic contamination of ground water.

Applications of research-based scientific knowledge have improved lives of millions of people in the world. Science-based opportunities have primarily benefited populations in industrialized countries, rather than that in developing countries. Cultures that value and are able to apply scientific knowledge tend to make rapid economic progress, while cultures that have relied on traditional products, with much

lower value added, are unable to take advantage of new science-based opportunities. One of the keys to economic success today is the provision of high quality education in science and technology. Today, technological advances occur so rapidly that only a highly qualified workforce with research and training knowledge in the respective fields is able to evaluate and modify such technologies for local use.

For a country to be competitive, a critical mass of people must know how to create new scientific and technological knowledge. Importing scientific talent and scientifically-trained labour, on which some rich countries rely, is not feasible for developing countries like Bangladesh. As such science policies that provide a strong motivation for science- and technology-based careers have become a necessary condition for the creation of an internationally competitive workforce.

Information and communication technology (ICT) is a technology that is fundamental to scientific research, and to the communication and application of science. Training in ICT to access and analyse information is critical for scientific research and industries based on scientific knowledge. The gap in communication between scientists and society means that scientific and technological issues are often poorly understood by the general public and by policy makers.

The specific objectives of the e-skill development project are:

- to create e-skills workforce in the community.
- to develop e-skills capacity in the society as a whole i.e ICT practitioners skills, ICT users skills and ICT skills at community (e-literacy) must be developed.
- to collaborate with, and complement with the work of higher education.
- to respond in time, the demand for e-skills in the private and public sectors.
- to act as a change agent to increase the country's indigenous e-skills capability.
- to undertake world class needs based research in support of e-skills development
- to contribute to the on going development of e-skills strategies, policies and initiatives.
- to identify the needs and requirements of “digitally impoverished” communities who are to be targeted;
- to carry out applied research and development in ICT that is specifically tailored to address local requirements on health care, agriculture and education; and
- to investigate existing ICT solutions with a view to adapting them to the local environment.

Women are disadvantaged in almost all sectors of science and technology and they have, culturally and socially, been discouraged from participating in training in new technology in most countries of the world. Women must be welcomed, encouraged and enabled to play an integral role in technological advancement if global capacity building is to succeed.

The contamination of ground water with arsenic is an example of a health crisis that affects millions of people in Bangladesh who are not aware or not informed about the potential hazards, key among these being the women who are at home cooking, washing clothes and taking care of the family. Training on e-skills for women doctors and researchers in rural areas can facilitate the exchange of information about technologies designed to solve this problem, reduce the communications gap between scientists and society, and improve access to population in remote and disadvantaged areas, where women would encounter difficulties in communicating openly with a male professional.

The main issues in this project were “technology to improve the quality of life” and “technology for sustainable development”, with the aim of extending the benefits of information technology to all levels of people for the improvement of their quality of life.

In early 2000, an initiative was taken by the Association for Advancement of Information Technology (AAIT) to improve quality of life of people living in a remote river island of Bangladesh through application of effective technology particularly, ICT in diverse ways. Bangladesh consists of several hundred similar river islands and people living in those islands are deprived from all sorts of modern facilities including communication systems.

Before embarking on project activities, 112 women scientists, technologists, researchers, medical doctors and social workers associated with indigenous communities were trained on ICT applications. The purpose of training women professionals with ICT was to utilize their vast knowledge resources for solving community problems that they are aware of, and to develop the targeted communities in education, health, poverty and other sectors identified by trained experts in cooperation of community people who are rich in indigenous knowledge.

Establishment of the ICT based university in the rural atmosphere of Bangladesh in cooperation of the ministry of the ministry of education, ministry of science and technology, Texas based ICTE, UNESCO, GASAT, WIGSAT and Commonwealth Science Council (CSC) helped develop the project in early 2000. A community primary school, junior high school, vocational school, post office and resource centre established on initiative of AAIT in the river island of 20 sq. kms area have enabled the trained professionals to bring a significant change in respective fields using the institutes as platform and ICT as all pervasive tools in a community of 12000 indigenous people.

METHODS

Part of methodology employed was a process of exploration of the problems. My role was as a facilitator to assist trainers and resource persons in exploring the problems. This is consistent with the view that a facilitator is a “resource person” who is not “a primary source of knowledge”, rather someone who can provide support and assist learners to find their way through the process.

In the initial stage, AAIT has organized ICT training programmes to build capacity of scientists, technologists, researchers and medical doctors to improve their e-skills in professional effectiveness and efficiencies. This training has enhanced the key roles of these professionals in the exchange of scientific information via the rapidly advancing world of information technology and has enabled them to connect with colleagues worldwide and to access sources of information that provide relevant tools.

INITIAL COURSES

Locally-based trainers ran three training courses on ICT at basic (Fundamentals of the computer, Operating systems: DOS, Windows 95, Role of software, hardware classification) and more advanced levels (Trouble shooting, Network, Internet, E-mail, PowerPoint presentation, Multimedia operation, Programming language) at various venues in Dhaka between July 1997 and May 1998. The participants (20 per course) were carefully selected to enable the maximum number of organizations and individuals to benefit from each programme. Participants were selected from among applicants from fields spanning life sciences, physical sciences, social sciences and engineering, and from non-governmental organizations, the private sector, individuals, service institutions and semi-government institutions.

For the first course, held in July 1997 in Dhaka, participants were drawn from government institutions responsible for agriculture, education, energy, environment, fisheries, forestry, health, industry and mineral resources. The second course, held in November 1997 in Dhaka, included participants from research institutions related to building, communications, electronics, fuels, food science and technology, housing, jute, meteorology, remote sensing and space technology, and from academia, local government, the national library and television. This course was observed by an expert from Pakistan who subsequently replicated the project in his country. The third course was also held in Dhaka and took place in May 1998. Shortly after each course, a follow-up visit was made by project staff and the trained participants were contacted at their workplaces.



Figure 1. Senior women scientists, technologists and researchers in ICT Training course held in November 1997

TRAINING COURSES FOR WOMEN WORKING IN THE MEDICAL PROFESSION AND RELATED FIELDS:

Three years after the second course, in August 2000, AAIT officials and representatives of the donor agency, Commonwealth Science Council (who had attended the second course) met with the former participants in Dhaka to determine how they were faring and to draw on their experiences in the context of planning subsequent stages of the programme in regional centres. All former participants reported that their training had contributed greatly to improving their effectiveness in their jobs. They singled out items of the course that were of direct relevance to their professional activities and noted the continued availability of AAIT for informal follow-up as an important facility.

Recognizing the value of the approach, the Commonwealth Science Council provided additional funds to AAIT, this time to provide training for women involved in the medical profession and related sciences such as microbiology, nutrition, pharmacy and physiology and in more remote regional centres, rather than in the capital city (Fig. 1). This was based on the concept that a health-information infrastructure based on computers and electronic communications could be the “development vehicle” to enable a more general development of capacity and infrastructure for Bangladesh, since the health sector extends to the most isolated/disadvantaged people of society. As a result, in 2000, two additional training courses were organized in centres in the northern region of Bangladesh, with a total of 52 female participants drawn from medical colleges, universities, hospitals and clinics across the country.

TRAINING FOR PEOPLE IN RURAL AREAS

Universities are the best platform for the development of human resources and ICT is the best tool for the spread of development. On the initiative and with the co-operation of 112 women scientists, technologists, researchers and medical doctors trained in ICT by AAIT, an ICT-based university was established in 2002 in a rural region of northern Bangladesh. Initially it was named as the University of Association for Advancement of Information Technology (UAAIT) that was later changed to Pundra University of Science and Technology (PUST). This project was funded by local entrepreneurs among whom awareness of ICT issues had been raised by AAIT-organized ICT training programmes in the region. The ICT courses for the university were designed by AAIT experts in cooperation with universities based in Commonwealth countries.

In initiatives to combat lack of knowledge, awareness or information at every level and to promote the benefits of technology in rural areas, AAIT has helped to establish community primary, secondary, vocational schools and a post office in an area surrounded by the river Modhumoti in Bangladesh. The resource centre for Indigenous Science and Technology at Ikraail (ISTI) was established in 2000 on the remote river island close to the schools in 2000 with support from AAIT, using funds from the founder and local people as well as government. Students should have opportunity to use computers as a learning tool for all subjects; free Internet services will be provided to students and teachers, and science and technology workshops, seminars and exhibitions will be organized. The courses will be designed by the government boards of primary, secondary and technical education. These are the main targets of the institutes.

CONTRIBUTION:

A community primary, junior high, vocational school, post office and resource centre established by AAIT in the circular shaped river island of 20 sq. kms enabled the trained professionals to bring a significant change in respective fields under the auspices of the University of AAIT. Contribution from the Commonwealth Science Council (CSC) and the ministry of science and ICT (govt. of Bangladesh) as financial and logistic support, and follow up by the CSC, ministry and AAIT led the project to create a success story in the ICT world.



Figure 2. The girls of the rural community of project area are working before going to school in the morning.



Figure 3. The teacher of agriculture is taking class on vocational courses for e-skills development



Figure 4. The students are taking oath along with teachers before going to the classes.

AAIT group is transforming attitudes, inspiring interest and preparing young people with the technology-related knowledge and skills employers need. AAIT is also transforming the attitudes of young people to IT-related education and careers.

AAIT on e-skills project is working in partnership with colleges, universities and employers to develop exciting programmes relevant to the skills needs of the industry and all businesses. The other contributions:

Supporting universities in developing and promoting courses that reflect the needs of IT professionals' careers.

Combining academic and work-based learning

Improving return on investment in IT user skills

AAIT for e-skills is preparing the existing workforce with the technology-related skills employers need and is helping small businesses make the most of technology.

IT PROFESSIONAL SKILLS

- IT Professional Development Programme – a revolutionary development programme to fast-track the careers of new IT professionals
- Developing young people in their early careers – including information on Higher Apprenticeships
- Providing a standardised approach to defining IT professional competencies

IT USER SKILLS

- Improving return on investment in IT user skills
- Compelling case studies showing how successful businesses have used IT and developed their IT skills

SMALL AND MEDIUM COMPANIES

- Helping small businesses make better use of IT to improve productivity and competitiveness
- elearning – types of technologies appropriate for learning at work

EVALUATION:

Evaluation is the critical part of the ICT based university for e-skills development project. The initial of the project was positive. The women had enjoyed undertaking the project and felt that they had learnt a good deal about their relevant technology and in the process had gained confidence in dealing with technology in general. There was a general sense of satisfaction not only for the women who work on the project but also for their families and friends who were proud of their achievement. It has been a decade since the completion of the training project. The women who participated in the training programme, had achieved a sustainable solution, when conventional technical responses had failed. It was the opportunity the women had to engage with a learning environment that was respectful and validating their knowledge and skills, that used negotiation to set the parameters for how the learning would occur and utilized appropriate resources to support their efforts.

At the initial stage, the project of establishment of the ICT based university in the rural atmosphere was supported by all levels of local people and the government. When the academic activities started, lots of problems were identified and huge barriers were created. The problems are mainly social, cultural, local, financial, infrastructural and technological. Those were not anticipated at the initial stage. As founder vice-chancellor of the ICT based university, I had to face unlimited problems of various types that needed extreme tolerance and social involvement capacities. The experience cannot be gained without facing the real situations. It is a real learning place and project for those who are interested to start an institute in rural atmosphere for e-skills development.

A lack of confidence has been identified as a barrier to the people participating and I have demonstrated that prior knowledge is critical in making informed decisions about technology. The importance of education is broader than just up-skilling women, it can lead to a shift in the perception of women's role and build confidence that has implications for women participating in making informed decision about e-skills and technology.

REFLECTION:

According to a survey report of AAIT in 1998, it was observed that medical doctors (male and female) were initially resistant to learning new technology, particularly ICT, and many felt that participation in an ICT learning programme would be a waste of time—a pen, piece of paper, thermometer and stethoscope being sufficient tools for their profession. Soon after being introduced to the benefits of using a computer (e.g., writing, editing, correcting and printing from the same workstation at the start of each course) doctors began to realize the importance of ICT- applications in medicine and health care, and at final evaluation after attending a training course, every medical doctor surveyed commented that all doctors and health-related professionals must have ICT skills.

A comparative study among participants of different professions has shown that medical professionals obtain the highest benefit from ICT skills. Their areas of work have expanded considerably and, as a result of ICT training, they are now able to communicate with more experienced and skilled colleagues nationally and internationally to obtain help and advice, to use various soft wares to keep patient records and to participate in medical research.

Employers were highly impressed by the output of the computer-related assignments given to 52 medical doctors. These doctors in turn recommended training an additional 2,000 medical doctors with ICT, although funding problems have meant that this project has not yet been initiated. Some of the trained participants are now organizing courses in their own organization within their limits.

The courses have also led to the beginning of a team of female doctors, educationists and tele-workers empowered to implement tele-medicine, tele-health care, tele-education and tele-design across Bangladesh. This team is organized by AAIT, and various non-governmental organizations, n l donor agencies.

Very satisfactory and encouraging interaction is going on among AAIT group, trained professionals, scientists, technologists, researchers, policy makers, international organizations like UNESCO, IDRC, DFID, SADC, GASAT, Commonwealth Secretariat, Wilton park conference, WIGSAT and other gender and ICT related organizations and individuals, using the modern technology tools such as emails, fax, phone, mobile and sometimes face to face meeting attending effective events all over the globe. Excellent cooperation from all sectors is leading the project to its destination.

Science and technology are fundamental tools to achieve a smooth transition toward the conservation and sustainable use of biodiversity. Local and rural population participation is essential to change patterns of harvesting, consumption and production. It is vital to improve communication and cooperation among scientists and other stakeholders of biodiversity. Capacity building and education at all levels are also essential to promote conservation and sustainability. Scientists and technologists are

playing a key role in developing, planning and decision making in the initiative taken by AAIT. Science and technology knowledge, indigenous knowledge, ICT knowledge, awareness development among local people, tolerance, perseverance, cooperation and coordination of ISTI resource centre, AAIT and CSC have made the initiative sustainable.

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EMPOWERING NETWORKS: HOW THE COMMUNITY MAY SUPPORT TEACHERS IN PEDAGOGICAL USE OF ICT?

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The purpose of the study was to examine the network structure of a teacher community related to the pedagogical use of information and communication technologies (ICTs). In addition, the study aimed to find out what are the factors in the community that support or challenge teachers' professional development related to the use of ICTs? The methods applied were Social Network Analysis (SNA); a questionnaire designed to assess networking relations among the participants, and UCINETT-program for uncovering the patterns of people's interaction. Further, the phenomenography was used as an approach for analysing the data gathered by interviews of teachers. Phenomenography is a research method for mapping the qualitatively different ways in which people experience and conceptualize the world around us.

The results of the study indicated that the members of the community differed in terms of their use of ICT-related networks and informal interaction networks. There were a few central actors in the community, who dominated technical and pedagogical information exchange and to whom their colleagues actively turned when seeking advice. These actors tended also to have their own external networking relations that helped them to keep up their high level of competence. The participants' ICT-related egocentric network differed in size and density. There were some actors central to the network of informal interaction that were, simultaneously, peripheral in ICT-related networking activities. The actors shared both technical and pedagogical knowledge of web-based learning in networks that include both internal and external relations in the community and involve people, collaborative technologies and a variety of media. Furthermore, the central actors appear to bridge different fields of teaching expertise in their community.

According to the teachers' experiences the important factors that support teachers' professional development related the pedagogical use of ICT in the community were; the possibility to learn from colleagues and from everyday working practices, an emotionally safe atmosphere, the leader's personal support and community-level commitment. Also, the flexibility in work planning, challenging pupils, shared lessons with colleagues, training events in an authentic work environment and colleagues' profes-

sionalism are considered meaningful for professional development. As challenges, the pedagogical use of ICT in the community needs mutual interests, transactive memory, time and facilities, peer support, a safe atmosphere and meaningful practices.

In the present method required that participants made retrospective generalizations regarding their networking relations, but studying a dynamically evolving network would also be important. In the present study, it may have been cognitively rather demanding to determine the nature of networking relations across all members of one's workplace community. A more optimal, but much more labour-intensive method would have been to ask the participants to keep a record of their networking interaction on day-to-day basis. In addition, the size of the present community (N=33) may be a limitation; it was chosen to be manageable. It is difficult to judge the effects in the present case, but it is possible that some of the less frequent interactions would appear differently for a larger sample.

On the basis of the findings of the study it is suggested that by teachers' networking it may be possible to break the boundaries of individual teachership and create such sociocultural activities which support collaborative professional development and more effective pedagogical use of ICT in the teacher community. Teachers' in-service training programs should be more sensitive to the culture of teacher communities and teachers' reciprocal relations. Teacher trainers should design teachers' in-service training of pedagogical use of ICT in paying attention into the networks of teachers', which include also media and technology and as well as people.

THE DISTRIBUTED AND MOBILE NATURE OF KNOWLEDGE-INTENSIVE WORK: CHALLENGES TO TEACHING AND LEARNING

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Online learning has been developed at all Finnish universities of applied sciences (also known as polytechnics) over the last ten years, while teaching and learning practices have also been changing. Online learning in this context means learning that is supported by or partially based on materials, tutoring and knowledge sharing accessible through information networks and the Internet. The expansion of online learning has been driven by challenges to create a new type of learning culture, students' growing demands, internationalisation and hopes of reducing costs. This paper reports a study of pedagogical leaders, online learning coordinators and teachers in six Finnish universities of applied sciences.

Universities of applied sciences should prepare students for methods used in their future working life. A challenge for education is to pay more attention to the distributed and mobile nature of knowledge-intensive work (Vartiainen et al. 2007). The job content of knowledge workers is both cognitively and socially demanding, as multi-locational employees collaborate with each other from afar.

New technology makes learning possible in just-in-time and on-demand situations. The application of networked expertise and knowledge building (Hakkarainen et al, 2004, Bereiter et al, 1999), networked learning (O'Hair & Veugelers, 2005), virtual learning communities (Lewis & Allan, 2005), horizontal learning (Tuomi-Gröhn, Engeström & Young, 2003) and communities of practice (Wenger, 1998) to the field of virtual education and work can be considered a common theoretical frame of reference for research in this context.

The key competences of distributed and mobile work are not to do with the technology, but knowledge building, knowledge sharing and knowledge management, making good use of technology. Teachers ought to create a learning space where students in authentic situations can practice the competences of their future working life. The most significant feature of an authentic learning task is that this must deliver a learning experience closely related to reality. Herrington and Oliver (2000) have formulated conditions to be met by authentic learning tasks, but this study showed that few

teachers in Finnish Universities of applied science have competences to create the learning spaces where students in real situations can practice these skills and build knowledge.

The research question for this paper is 'What factors promote the implementation of online learning among studies at universities of applied sciences?' The data come from development projects at six universities of applied science. The purpose of the study is to describe the phenomenon of management of online learning and to identify factors influencing adoption of online learning methods within organisations. Interviews were conducted with teams (of two-six people; $n=24$) in autumn 2006 and spring 2007, using an open-ended questionnaire, and analysed using the 'significance of strategy components to successful change' model (Knoster 1997, Pohjonen 2001).

External pressures and jointly specified objectives and instructional methods in curriculum appear to support development of online learning. The highest levels of online learning among teachers were achieved in those universities where change is implemented in communities of practice and activities are based on shared expertise. The interview data show that change leaders seem to play an important role with their decisions on the direction of change. It may be collegial leadership, but the most important thing is the opportunity to take steps in the chosen direction.

Integration of online learning into daily work seems to produce the best results in developing the competencies of teaching staff. Learning new software applications and producing virtual contents in small steps increased teachers' confidence in their own abilities. When teachers are training in online learning, basic technology training is important, but more important is to find teachers own creative teaching styles, making use of the different opportunities provided by digital tools and the social Web. All interviewed emphasised the importance of just-in-time technical and instructional support. Support should be available especially at the beginning, when teachers practise online teaching.

Teachers and students were cooperating with enterprises, yet virtual work outside the educational institution with representatives from the world of work still felt relatively challenging (cf. Vartiainen 2007), and they wanted to obtain personal experiences with their own colleagues first. Consequently, leaders of online learning play a key role in providing positive feedback and highlighting successes – creating confidence to expand activities.

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