

Bridging the Digital Divide

Building [cutting-edge technologies] is a prerequisite for creating a level playing field for all countries to compete in the global economy and to take advantage of the full potential of scientific endeavours for societal advancement and sustainable development.

(31C/4, Strategic Objective 6, page 34, paragraph 117.)

Introduction:

We live in a wonderful age. Technology is revolutionizing all aspects of our lives from agriculture and medicine to manufacturing and science. Every year, the very limits of what we know and what we can accomplish are pushed farther and farther. Each new technological advancement builds on the previous creating an unprecedented era of accelerated human achievement.

Unfortunately, this human achievement does not translate into universal human development. In fact, the very promise of accelerating technological advancement threatens to create not just a digital divide but an immense economic and societal chasm between the “technology-haves” and the “technology have-nots”.

The objective of this high-level outline is to create a program that will accelerate the transfer of technical and ICT knowledge and skills to the developing world by leveraging existing resources and developing new partnerships – in particular with the private sector. To accomplish this aim, the most common issues that currently impede the progress of technology and ICT education in the developing world must be addressed.

These issues are:

1. Lack of international standards for technology education
2. Inadequate technical competency (teachers training)
3. Poor technical infrastructure

The following recommendations address each of these issues.

“EFA is at the heart of UNESCO’s major educational activities to: ... establish new norms and standards on vocational and technical education, for example the recognition of higher education qualifications.”

(UNESCO, *What it is and what it does*, page 4.)

Building Universal Skill Standards

In harmony with its mission to develop universal principles and norms as well as to be a standard-setter and catalyst, UNESCO is in a unique position to facilitate the establishment of critically needed skill standards for technology and ICT education.

Today, millions if not billions of dollars are being spent by individual governments, educational institutions and the private sector to establish technical and ICT skill standards that are used to create curricula, assessments and academic credentials. These educational outputs vary in their quality and do not reference commonly accepted frameworks. For example, the simple term “computer literacy” has a wide range of meanings. Courses created to teach “computer literacy” will have different objectives and therefore produce different outcomes. It is up to individual curriculum developers to determine their own objectives for “computer literacy” and, unfortunately, this is far too often done in isolation and at great expense. Students taking these varied “computer literacy” courses are consequently improperly prepared to do the work that industry requires. This creates another form of digital divide – the divide between academia and the workplace. The current practice of developing individual skill standards represents a gross waste of resources and a barrier to the advancement of the international recognition of credentials and transferability of skilled workers.

In addition, the European Union is committed to facilitating teacher credential recognition within the EU by 2008. The United States is working on the “Career Clusters” project and every major software and hardware vendor has certification programs for its technologies. Nevertheless, these important efforts are not coordinated and the result will be a wider diversity of standards further complicating an already complex environment. Larger economies can afford to develop proprietary standards but LDCs inevitably suffer.

I recommend that UNESCO convene an international forum consisting of appropriate UN bodies (e.g. ILO, IAU, IYCP, UNDP, IBE, IIEP, IITE, UNEVOC, National Commissions etc.), governmental agencies, educational bodies,

professional associations, commercial training institutions and the private sector (in particular the leading providers of technology and technology education including: Microsoft Corporation, Cisco Systems, Oracle Software etc.) to establish international skill standards for the following suggested categories:

- Business Applications
 - a. Word Processing
 - b. Spreadsheets
 - c. Presentation Software
 - d. E-mail Software
 - e. Internet Browsers
- Interactive/Digital Media
 - a. Design and Development Tools
 - b. Production
 - c. Web Development
- Information Support and Services
 - a. Database Development
 - b. PC Hardware
 - c. Operating Systems
 - d. Technical Support Services
- Programming and Software Development
- Networking
 - a. Network Administration
 - b. Network Engineering

These standards will be developed to reflect the specific needs of primary, secondary, tertiary and vocational education.

Expected Outcomes:

- 1) An enduring mechanism to address the challenges of evolving skill sets inherent in technology and ICT education.
- 2) An internationally-recognized skills database which assigns a standard value to specific technical and ICT skills.
- 3) Increased teacher accreditation transferability.
- 4) Enhanced recognition of training, certification and degrees within the international community.
- 5) Cost savings to developing nations who can adopt internationally recognized standards without creating them on their own.
- 6) Increased collaboration with and financial contribution from the private sector on the definition and implementation of universal skill standards.

*“Jointly with the International Labour Organization and other willing agencies, UNESCO will formulate an international long-term programme for the **development of technical and vocational education and training, including teacher training and alternative delivery mechanisms.**”*

(31C/4, Renewing education systems, page 25, paragraph 79.)

Building Technical Literacy for Teachers

Providing teachers with up-to-date knowledge and skills is an on-going challenge for LDCs. When the complexity and rapidly changing nature of technology is added to the equation, this challenge becomes nearly insurmountable. Clearly, a mechanism is needed to transfer technical abilities from the technologically developed North to the developing South.

I recommend that UNESCO organize and administer an on-going technical training programme for teachers. This programme would leverage existing organizational resources and create new services aimed at technical-capacity building for teachers. This would entail directed collaboration with UN bodies (e.g. ILO, IAU, IYCP, UNDP, IBE, IIEP, IITE, UNEVOC, National Commissions etc.), governmental agencies, educational institutions, professional associations, commercial training companies, charitable/humanitarian organizations and the private sector.

In cooperation with local authorities and national commissions, universities will be selected to serve as UNESCO Technical Education Centers (UTECS). These UTECS, will receive free technical training for its teachers and benefit from curriculum and technology grants when available:

Local Training Activities: UNESCO will coordinate the technical training for each UTEC. This training will take advantage of distance learning tools (perhaps via the UNESCO knowledge portal) and when necessary include on-site training sessions. Trainers will be selected from qualified volunteer applicants. This will allow for a low cost technical knowledge and skill transfer from North to South.

Regional Training Events: To supplement the local teacher training, UNESCO will organize regional training events to address issues related to culture and/or language. The regional composition would be determined on the local level and the actual event hosted by a UTEC.

This will facilitate South – South dialogues to address regional, cultural and linguistic needs in technology education.

UTEC Annual Conference: Once a year a UTEC conference will be held to facilitate dialogue on the international level for technical training.

Although local and regional events are targeted towards the trainers, this annual event will be targeted toward university administration and ministry levels. This event will serve as a forum to further advance the programme objectives and influence technical education policies. This may even be combined with events that are sponsored by the IAU.

In exchange for the free technical training that they receive, UTECs will be required to train local primary and secondary teachers on technology topics at no cost. This leveraged training model will facilitate a high-quality knowledge transfer process to a large population. By design, UTECs will be in a better position to adapt and regionalize the curricula to address cultural and linguistic issues while building technical competencies in teachers of all levels.

UNESCO will work with existing private sector, charitable and humanitarian groups to coordinate the technical training for the UTECs. Much like activities of doctors who donate their time and services to mercy missions, a similar model will be developed for technical trainers. Qualified volunteers will donate their time for technical training seminars via a distance learning network or will serve as volunteer exchange teachers at a UTEC or other academic institutions. In addition, the private sector will be engaged to donate network time, facilities, employee time, technology, and curricula.

Expected Outcomes:

- 1) The establishment of a permanent, technical training programme incorporating existing resources and coordinating additional resources from civil society, the public sector and the private sector.
- 2) The creation of the UNESCO Technical Education Center programme.
- 3) A least one UTEC in each targeted LDC by January, 2008.
- 4) Thousands of instructors trained (primary, secondary and tertiary levels) globally by January, 2009.
- 5) The creation of volunteer opportunities for technical trainers and enhanced humanitarian projects focused on technology education.
- 6) Increased involvement from the private sector (in particular North America) in technical training for LDCs.



*“A key part of this strategy lies in **promoting access to information** through a range of activities. For example...UNESCO also supports community **multimedia centres** and **telecentres** in isolated areas of developing countries.”*

(UNESCO, [What it is and what it does](#), page 7.)

Building the Technical Infrastructure

A significant barrier to technology education in the developing world is the lack of an adequate technical infrastructure. This can manifest itself in the form of poorly equipped classrooms, outdated or non-existent hardware/software and expensive or substandard telecommunications systems. In order to bridge the digital divide in the developing world, it is imperative that there be a transfer of more than just technical knowledge - there must be a physical transfer of technology as well.

I recommend that UNESCO coordinate the technical infrastructure development projects for educational purposes. In cooperation with national commissions, local authorities, charitable and humanitarian organizations as well as the private sector, UNESCO will manage the creation of specialized technology education classrooms. These classrooms will take a variety of forms depending on the specific circumstances and needs of the target population.

In some cases resources from donors will be directed to further develop UNESCO telecentres and multimedia centres to adequately equip them to support local training efforts. Not unlike the notion of a public library, these telecentres and multimedia centres will be used by local teachers who do not have access to technology in their schools. At a minimum, these centres should have at least two computers with monitors, business application software, one printer, a simple local area network and internet access.

In other cases, UNESCO will coordinate grants for technical development projects in existing schools. A needs analysis will be conducted in cooperation with national commissions and local authorities to determine needs on a school by school basis. The goal will be to bring each school up to a minimum technical standard which could include: computing devices, display devices, printing tools, networking and internet access.

In extreme cases, UNESCO will direct the development of mobile technology classrooms to bring computers, networks and wireless internet connectivity to

remote populations on a regularly scheduled basis. These classrooms on wheels will be managed by either UTECs, UNESCO national commissions or humanitarian organizations who will facilitate teacher training. A secondary benefit of these mobile technology classrooms is their ability to respond to emergency situations. Certainly, in true emergency situations they will be little need for technology education. In those cases, these classrooms can be used to support relief workers and other humanitarian efforts.

To further reduce of the cost of infrastructure development, high-fidelity technology simulations will be employed whenever possible. In that way, students can learn to manage, configure and maintain sophisticated hardware, networks and related software at fraction of the cost. Simulations offer a viable alternative to real hardware and software from a cost and security perspective. These simulations can often be delivered on CD or over the internet and replace tens of thousands of dollars worth of equipment.

Primary, secondary, tertiary and vocational schools will all benefit from these technical infrastructure development initiatives.

Expected Outcomes:

- 1) Increased quality and quantity of technology-ready classroom settings.
- 2) Improved access to information, the internet and media.
- 3) Enhanced ability to teach and develop technical capacities in at risk populations.
- 4) Improved technical infrastructure to support local economies and relief efforts.
- 5) Accelerated technology knowledge and skill transfer to LDCs. (In conjunction with teacher training.)
- 6) Increased interaction between civil society, the public sector and the private sector (particularly in the North) with LDCs.

“UNESCO will act as a catalyst for international cooperation in education mobilizing partners and resources in the pursuit of EFA Goals.”

([31C/4](#), Building partnerships for EFA, page 17, paragraph 58).

Summary

The digital divide is an increasingly important issue facing the populations of the world. The efforts of individuals, educational institutions, governments, charitable organizations and the private sector are, by themselves, not sufficient to make a lasting difference. These efforts must be coordinated and directed to be effective.

UNESCO is truly in a unique position to effect a positive change in the lives of millions of people around the world. Through cooperation, creativity and determination, UNESCO can bring tangible technology education solutions to the developing world. The resulting technical knowledge and skills will serve as a solid foundation for development and a powerful catalyst for the improvement of the quality of life in the developing world.

No other organization on earth has the vision, resources or mandate to accomplish such a noble undertaking.

If not UNESCO, who? If not now, when?

Author’s Note: In addition to the issues mentioned above, two additional issues affecting the success of technology education should also be explored by UNESCO. These are: 1) the availability of high-quality curricula and 2) sources of educational funding for individuals and institutions. For the purpose of brevity, these topics were not discussed in this proposal. Nevertheless, these topics represent significant barriers to successful technology education in the developing world and should not be overlooked.