"Science and Development: Innovation Systems for Fighting Poverty"

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UNESCO's Activity in Engineering, Science, and Technology for Poverty Reduction

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UNESCO

UNESCO, Innovation and Development

UNESCO:

UN Educational, Scientific and Cultural Organisation

Fields of Action:

Education

Natural Sciences

Social and Human Sciences

Culture

Communication and Information

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UNESCO functions in the following areas:

Laboratory of ideas and standard-setting

  eg world conferences, reports, conventions

Clearinghouse

  for the sharing of information and knowledge

Capacity building

  human, institutional and infrastructure

To facilitate

  international co-operation, intercultural dialogue

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Science in UNESCO:

Water Sciences

Ecological and Earth Sciences

Basic and Engineering Sciences

Science Policy and Sustainable Development

Innovation relates especially to engineering, science and technology (EST) and S&T policy

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Engineering, S&T at UNESCO - current activities

Capacity building in EST

EST for poverty reduction

EST for sustainable development

Promoting international cooperation in EST

These activities relate to applications - innovation

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Knowledge Societies, Knowledge Economies

Interest in innovation goes back to the 1960/70s

Wealth from Knowledge: A Study of Innovation in Industry, Langrish and colleagues

Recognition of need for knowledge, generation and application of knowledge for development – eg …

In developed AND developing AND least developed countries

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Importance of knowledge in social, economic and cultural development has been emphasised at:

World Summit on the Information Society, Geneva, Tunis

World Summit on Sustainable Development, J'burg
    and Decade of Education for Sustainable Development

World Conference on Science, 1999

World Engineers' Conventions – 2000, 2004, 2008

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Also emphasised in recent reports, including:

UN Millennium Project Task Force on Science, Technology and Innovation report: *Innovation: Applying Knowledge in Development*

Report of the Commission for Africa: *Our Common Interest*

InterAcademy Council Report: *Inventing a Better Future: A Strategy for Building Worldwide Capacities in Science and Technology*

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Increased interest in innovation and development:

World Bank

G8 – Gleneagles commitments on aid, debt relief, export subsidies, development of infrastrucure and education.

SIDA-UNESCO Forum on Higher Education, Knowledge and Research

As noted in the IAC report, we need capacity and capacity building in EST and innovation

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Innovation and engineering applications:

Not just hi-tech

Includes introduction of technology that is new to the user and user-group

eg – new water pump for African farmers:

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Drivers of innovation for development

Relates to science and technology policy, and to the inclusion of EST in economic and financial policy

In developed countries this involves established "Policy Drivers"

BUT - who drives policy in developing and the least developed countries?

Policy drivers for innovation and MDGs

Policy instruments promoting EST and innovation for the UN Millennium Development Goals:

- ◆ Poverty Reduction Strategy Papers (PRSPs), for debt relief, and implementation of PRSPs

- ◆ need for science, technology and innovation policies

- ◆ broader issues for economic and financial policy

- ◆ need to promote better linkage of EST/innovation with aid/UN system and poverty eradication

- ◆ need to share good practice

Technology, Innovation and the MDGs

Technology and innovation are vital to address the MDGs:

1. Eradication of extreme poverty and hunger
2. Achievement of universal primary education
3. Promotion of gender equality and empower women
4. Reduction of child mortality
5. Improvement of maternal health
6. Combating HIV/AIDS, malaria and other diseases
7. Ensuring environmental sustainability
8. Development of global partnership for development

Technology, innovation, poverty reduction

Technology and innovation is vital for the overall MDG Goal of reducing poverty and hunger:

Poverty is mainly a reflection of the limited access of people to knowledge and resources with which to address basic and related needs

This includes water supply, sanitation, housing, food production, energy, transport, communications, income generation and job creation

Technology, innovation, poverty reduction

These needs relate particularly to technological innovation, and engineering, science and technology is vital in this process

Poverty reduction should therefore focus on:

Enhancing the access of people living in poverty to knowledge and resources in EST

Through - innovation and capacity building at the formal and informal levels

Technology, innovation, poverty reduction

Koïchiro Matsuura, Director-General of UNESCO

Engineering and technology is vital for development, we need to promote international commitments for engineering and technology to contribute to lasting development around the world. 2000

Kofi Annan, Secretary-General of the UN

I challenge all of you to mobilize global science and technology to tackle the interlocking crises of hunger, disease, environmental degradation and conflict that hold back the developing world. 2002

Bill Gates, Microsoft – to President Hu

Technology is the key, the essential enabler. 2006

Poverty and human rights

Poverty is also a denial of human rights

...poverty may be defined as a human condition characterized by sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights

(UN Committee on Social, Economic and Cultural Rights, 2001)

Poverty and human rights

Article 26 of the Universal Declaration of Human Rights (Paris 1948), on the "Benefits of Science and Technology"

states that:

Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit

Technology, innovation, poverty reduction

EST and innovation are therefore vital in addressing poverty and poverty eradication, including:

  Macro–economic development

  Micro-level direct applications

In such areas as: water supply, sanitation, housing, food production, energy, transport, communications, income generation and job creation

Through: access to knowledge and capacity building

Challenges for EST and innovation

In addressing poverty reduction, related challenges for EST and innovation include:

- human and institutional capacity building

- bridging the knowledge and information "divides"

- sustainable infrastructure development

- sustainable social and economic development

- promoting intercultural dialogue and cooperation

Related challenges for EST and innovation

There is increasing concern around the world regarding the decline in the interest in and number of young people going into EST

This will have serious consequences for future human resource capacity in EST and:

Constrain social, economic and infrastructure development, particularly in developing countries.

These points have been emphasised at various international fora: WCS 1999, WEC2000 and WEC2004, WSSD 2002

Challenges for EST education

Decline of interest/entry of young people into EST, especially women:

> EST is not interesting, boring

> university EST courses are hard work

> EST jobs are not well paid

> EST has a negative environmental impact

Need to understand and address, or:

not enough scientists and engineers, innovation – major impact on development, especially in least developed countries

Meeting these challenges

EST and innovation requires strengthening, especially in developing countries, in:

- EST education, training and CPD
- learning/teaching materials, curriculum development
- distance and virtual education, interactive learning
- standards, quality assurance, accreditation
- ethics, codes of practice, public understanding EST
- equity, participation, women/gender issues in EST
- EST policy, planning, innovation, application

Needs and actions

EST is not interesting, boring

    need to promote public understanding and perception

University EST courses are hard work

    need to make university courses more interesting

EST jobs are not well paid

    supply and demand?

EST has negative environmental impact

    need to emphasise and promote EST and innovation as a part of the solution, rather than part of the problem

Actions and opportunities

Promote public understanding, interest

    EST as part of the solution to poverty and MDGs

    Problem-solving in EST for a better world

DaimlerChrysler-UNESCO Mondialogo Engineering Award

    international/intercultural cooperation for innovation

Engineers Without Borders , Engineers Against Poverty

Make university courses interesting

    Reform EST curricula and pedagogy

    Activity-based learning, JIT approach, EST applications

Failure to meet these challenges

Borders Without Engineers?

Most important challenges:

> EST innovation, policy implementation, capacity

With too few engineers and scientists we will not:

> address the UN Millennium Development Goals, especially the reduction of poverty, sustainable social, economic and infrastructure development

This is the overall challenge for EST and innovation, and also creates some opportunities

Re-engineering EST education

Respond to rapid change in knowledge

synthesis, awareness, ethics, social responsibility, experience, practice, applications, innovation

Need to learn how to learn

lifelong learning, CPD, adaptability, flexibility, interdisciplinarity, multiple career paths

Cognitive, knowledge-based approach

emphasise experience, meaning, problem-solving, insight, project activity, teamwork

New wave in EST education?

Reform of EST curricula and pedagogy

Activity-based learning, just-in-time, hands-on, team and project work, relevance, applications and innovation

Remove obstacles and barriers

continuous assessment rather than examinations

Distance and continued learning

Use of internet and cyberspace, E-learning

Promote relevance and applications

Relevance and applications

Relevancy challenges for EST include policy, capacity building and applications for:

- poverty reduction and addressing the MDGs
- sustainable macro/micro social/econ development
- sustainable development of infrastructure, energy
- bridging the knowledge and information "divides"
- promoting intercultural cooperation and dialogue between EST people and local people
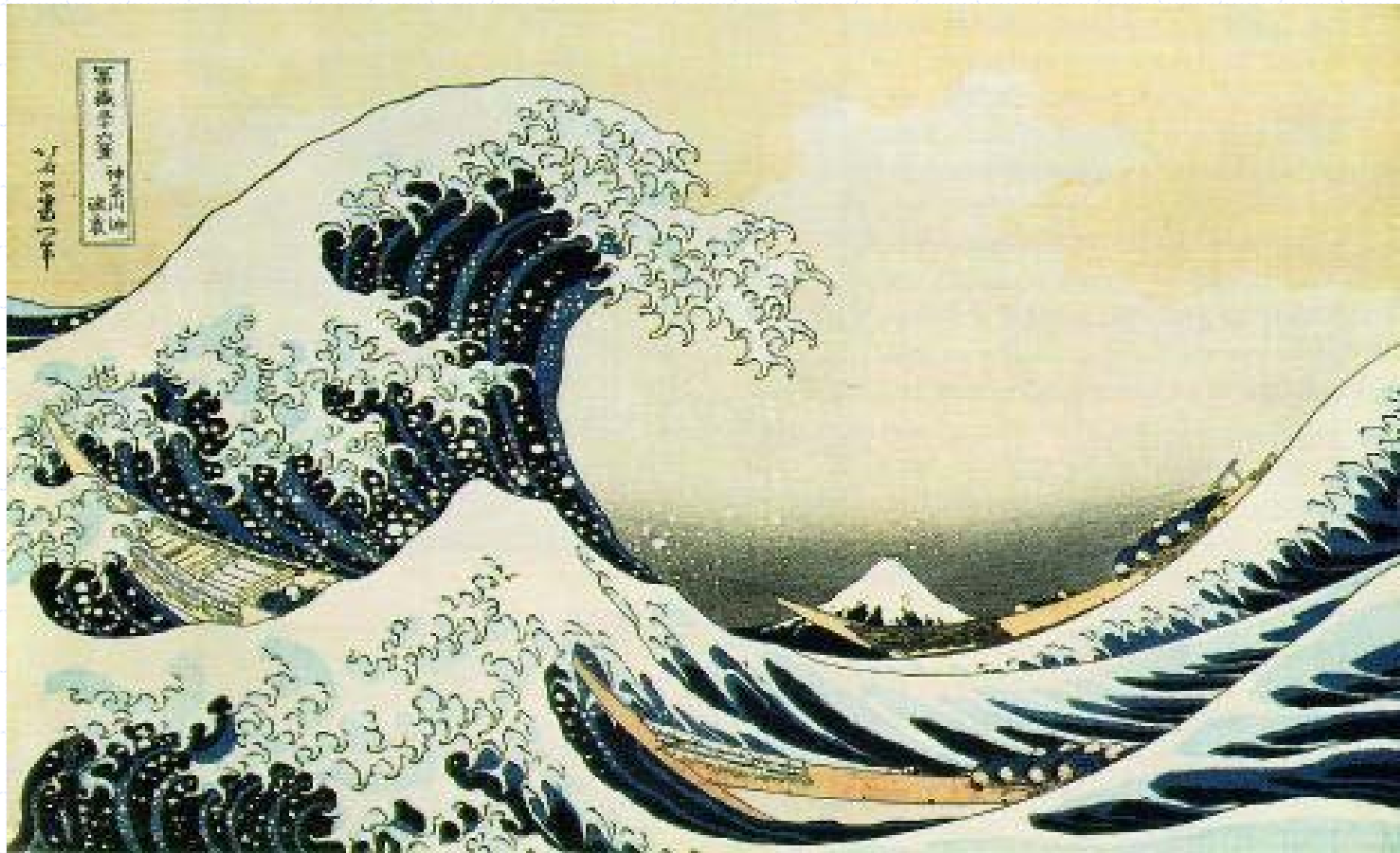
Key points

Engineering, science and technology is vitally important in addressing the UN MDGs, especially poverty reduction

This relates particularly to the application and innovation of technology, where engineering is vital - but engineers need to participate and advocate

We need to re-engineer EST education

We need to promote policy issues relating to EST, especially in the PRSPs, and policy implementation

Great wave

The new wave – innovation!