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Missing the Connection? Using ICTs in Education

This document summarizes recent research on how new technologies are being used in developing teacher education.

The spread of information and communication technologies (ICTs) in the last few decades has had a significant impact on work, leisure, culture, and social interaction. But can ICTs make a difference to development and education?

Why and how are ICTs being used in education—are they integrated into the system or simply added extras? How are they being used in teaching and learning? Given the high costs and shrinking resources in education, are ICTs a wise investment? What investment is being made in teachers and other roles necessary to support ICT applications? Are ICTs being used to bridge or widen gaps, or are they creating new ones?

There are typically two sets of responses to these questions. For some, ICTs have widened the divide between the technology-rich north and the technology-poor south. There is indeed a huge overlap between those subsisting on less than $1 a day and those without electricity or telephone connection. Within nation states a gap is emerging between the elite with access to information technology (IT) and the poor without it.

Others argue that ICTs offer developing countries the opportunity to catch up on development. This "leapfrogging" thesis asserts that developing countries can bypass the initial stages of development and it may even be beneficial for developing countries to enter the information age late(r) and so avoid the expensive teething problems of earlier stages.

These two responses reflect the optimistic and pessimistic views about ICTs. The optimistic view stresses the potential benefits of ICTs and argues that they have revolutionized the way people live. The pessimistic view sees the inequity ICTs can create and suggests that they are driven more by advances in technology geared to satisfying the needs of large IT companies than meeting development goals.

However, this debate has been largely rhetorical and lacks detailed consideration on the ways in which ICTs can be used in education in the developing world context. The claims that ICTs provide access to high-quality learning resources, extend scarce teaching resources, and improve efficiency are often taken for granted. While Leach considers how

computers can be used to develop the professional knowledge base of teachers and improve the curricula for learners, it is still unknown what impact ICTs have on teaching and learning performance.

Those in favor of ICTs in education often assume that placing high-grade hardware into schools will change teaching and learning. However, ICTs are merely educational tools which, as Leask points out, require careful planning and attention to human resource development such as teaching skills.

Unfortunately much of the discussion about ICT's has centered on computers only. Myers highlights how 'older' technologies such as radio can be used in education, in this case for raising health awareness in a rural context.

A common theme in this issue of insights education is that ICTs investment for education requires long-term planning that takes account of issues of sustainability and the new developments that ICTs-enhanced education may produce. If, for instance, schools plan to invest in software or content development, the initial and ongoing costs will need to be budgeted for. The significant financial requirements and the dependency on external funding that this entails may well cause developing countries to consider less expensive strategies such as educational television combined with community learning centers or telecenters.

Strategies that allow developing countries to experiment with different kinds of ICTs in different settings may well mean countries develop their own models of best practice. ICT investment should therefore consider the full range of available technologies.

Higher education is one area where arguably, ICTs can be maximized for teaching and learning purposes and where private education institutions can have an advantage. Burkle's Mexican private university case study highlights the teaching and learning changes that computers can produce, but reinforces the argument that using technology well relies on lecturers' motivation and skills. It also raises the issue of the extent to which the private model can be transferred to public-funded institutions.

Using ICTs in education means more than simply teaching learners how to use computers. Technology is a means for improving education and not an end in itself. Thus, ICTs should also be used to promote information literacy—the ability to access, use, and evaluate information from different sources to enhance learning, solve problems, and generate new knowledge. One aim of education should be to help learners become

more independent and effective information seekers and critical users. The common assumption is that as people become familiar and comfortable with ICTs, they will develop an information culture that generates critical thinking and awareness about knowledge production.

The debate over which technologies are appropriate and relevant in education has received little attention in the developing world context. Cawthera examines the use of 'low-cost' ICT solutions rather than the high-grade solutions that are quickly overtaken by advances in technology. However, cost-effective use of computers relies on regular maintenance and part replacement and one question here is whether using recycled second-hand computers can avoid this difficulty.

Many education technology projects in the developing world have failed to realize their goals because parts and technicians were unobtainable locally and staff were not sufficiently trained to make the most of the technology. If investment in ICTs for education is to be sustainable, it needs a proper long-term plan that considers these ongoing costs.

Developing effective partnerships with governments and the private sector is key to reaping the full educational benefits of ICTs. For example, governments might encourage the private sector to play a more socially responsible role by improving infrastructure pricing policy, or negotiate favorable connection rates for educational institutions. Selinger examines the role of the private sector in developing ICT skills, drawing on the experience of the Digital Partnership program and Cisco's Networking Academy Program.

The UK's Imfundo project is committed to developing partnerships between the public and private sectors. Pontefract argues that effective use of ICTs must be tied to the needs of developing countries and challenges the 'one size fits all' approach of many programs. More importantly Imfundo calls upon the private sector to demonstrate visibly its commitment to ICTs for education development.

These articles raise questions of relevancy and support the argument that ICTs need to become part of a broader development strategy rather than an add-on with limited impact. They highlight several crucial hurdles that need to be overcome if the possibilities that ICTs offer are to connect to genuine needs in the education system.

One further cause for concern is the difficulty in obtaining good quality software at a reasonable price. Software is not only expensive initially but even if free in the first instance (as with Microsoft's recent promise

to South Africa's public institutions), the cost of renewing the license prohibits many institutions from using it. Free open source software and alternative operating systems such as Linux are a practical way forward for many developing countries and pose serious challenges to the monopoly of large software firms. One target of private sector involvement should therefore be ensuring that developing countries have access to sustainable software that is tailored to their needs.

Sound and effective policy is the key to making sure that ICTs bring solutions that connect to real problems; otherwise it is likely that initiatives will be small scale and have little impact on the system. This requires collaboration among sectors including education, finance, and telecommunications.

Policymakers will also need to consider:

who will pay for ICTs in schools and how

the role the private sector should play

the appropriate balance between investing in training and infrastructure, such as software and hardware

what kind of software will be used

how schools that obtain ICTs and infrastructure will cover recurrent costs, e.g., Internet access and maintenance.

ICTs need to be used for more than simply reproducing learning by rote. Paying attention to issues such as human resource development and considering the full range of technologies will ensure that ICTs become real tools for education development.

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