Opportunities and Challenges for International Development Using ICTs in Education

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ICT is everywhere

- Business and commerce
- Government and nonprofit sector
- Education and medicine
- Personal and entertainment
Learning is everywhere

- Business and commerce
- Government and nonprofit sector
- Education and medicine
- Personal and entertainment
ICT for development through education is a knowledge management problem

Data ↔ Information ↔ Knowledge ↔ Wisdom
IT in the US

- 1965: Defense computing
- 1975: Mainframe business computing
- 1985: Desktop business computing, personal computing
- 1995: Internet computing
- 2005: “Web 2.0”, Cloud computing, etc.
IT in US Schools

- 1988: Edutainment
- 1993: Multimedia
- 1998: Internet surfing (Net Day!)
- 2003: Internet enabled games, software
- 2008: One to one computing
Demonstrated benefits

- Deeper learning (not necessarily more efficient)
- Access to more recent information
- Better research, collaboration, search skills
- Critical evaluation (there’s a lot of spam out there!)
For years, nobody could measure any impact of ICT in business.

Strangely, productivity in information businesses seemed to go up a lot regardless of IT.

Nowadays, IT is loosely linked to productivity but depending on other investment.
The computers account for 10% of what makes ICT work in business.
IT in Education
Productivity Gap

- Heavily dependent on teaching style
- May enhance disparities via digital divide
- Expensive
- Most importantly, relies on the success of a social infrastructure
TCO: Total Cost of Ownership

- One US School district: $1004 per computer
- Already had infrastructure
- Already had trained staff
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TCO additions

- Power, basic infrastructure
- Content development
- Teacher training
- Business process re-engineering
- Changing the way teaching and learning is done
Total Cost of Ownership for One Computer over Five Years

<table>
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<th>Inveneo Gen</th>
<th>Laptop Solar</th>
<th>Laptop Gen</th>
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</tbody>
</table>

One Computer TCO over Five Years

- **Computer**: $600.00 to $900.00
- **Power equipment**: $384.00 to $2000.00
- **5 Year Operations**: $0 to $2111.23
An Indian attempt

- All schools provided with new computers
- Generators where needed
- State-supported training
The realities

- High cost
- Generator too loud to use during school day
- Didactic style
- Content weak
- Community unimpressed
Important differences in developing countries

- Technical infrastructure
- Educational infrastructure
- Literacies and literatures
- Non-knowledge-based economies; non-capital-intensive activities
- Cultural mismatches with Western use-practices
If you want ICT to work you need

- Full cost support
- Willingness to let it change your systems
- Vision and invention
- Alignment with community goals
- Using ICT for what it is best for
Value-added of ICT

- 1980s: Replace the teacher: Automated quizzing
- 1990s: Replace the textbooks: Multimedia
- 2000s: Thinking tools: Productivity and representational tools
- 2010s: Crowdsourcing/coordination
- Also: Trojan Mouse, Distance Education, Back Office
Vannevar Bush’s Memex, 1945
BF Skinner’s Teaching Machine, 1968
Three laws

• 1. It’s not the technology. It’s what you do with it.

• 2. It’s not what the technology makes possible. It’s what the technology makes easy.

• 3. The trends in learning are far more important than the trends in technology.
Technology view

- Everyone will learn if we have educational radio to get information out
- Everyone will learn if we have educational TV to get information out
- Everyone will learn if we have CD-ROMs to get information out
- Everyone will learn if we have the Internet/e-Learning to get information out
Societal view

- Knowledge on tap vs. knowledge in the head
- Know-who vs. know-what
- Democratic vs. autocratic media
- Connected/global vs. isolated/local
- Dynamic vs. static; innovation vs. tradition
Recent projects

The Mountain Project, India and Nepal
Recent projects

• The gadget backpack: Participatory design of platforms for ed tech, Nepal with youth, local technologists, policymakers
Recent projects

- Anticipatory learning in climate change
Final words

• We must consider how learning in development is disruptive
  • Cultural and political power structures
  • Economic structures
  • Personal identity and agency