ICT Indicators in Education

Indicators Used to Measuring Usage and Impact of ICT in Education

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Integration of ICT in education lead to numerous ICT programs to be developed, strategies and policies to be constructed and adopted, hardware and software purchased and coded...

Yet very few studies focus on measuring the IMPACT of ICT on LEARNING

Key questions educators, policymakers, and donors are asking

Is ICT worth its high cost and the challenges it brings?
Is ICT changing education and how?
Is ICT helping us achieve our educational goals?
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To achieve focused measurement of the effect and impact of ICT use in education

Multi-stakeholder discussion sessions were held to clarify and unify definitions, criteria, goals and priorities

POTENTIAL ICT INDICATORS IN EDUCATION
# ICT Indicators in Education

## CRITERIA TO ASSESSING POTENTIAL INDICATORS

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Measure</td>
<td>Direct measure, supported by research</td>
</tr>
<tr>
<td>Objective</td>
<td>Unambiguous, constant definition, unidimensional</td>
</tr>
<tr>
<td>Adequate</td>
<td>Accurately measures attribute, few indicators as possible</td>
</tr>
<tr>
<td>Quantitative</td>
<td>Provides objectivity</td>
</tr>
<tr>
<td>Disaggregated</td>
<td>Easily manipulated to answer unanticipated questions</td>
</tr>
<tr>
<td>Practical</td>
<td>Reasonable cost, collectable</td>
</tr>
<tr>
<td>Reliable</td>
<td>Consistent, based on representative data</td>
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</tbody>
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“Developing and Using Indicators of ICT in Education” UNESCO, Bangkok 2003
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TYPES OF INDICATORS

INPUT
- Computer to student ratio
- Internet connectivity
- Internet speed
- Educational software
- Number of applications used

UTILIZATION
- Multimedia usage in academic subjects
- % of classes using labs
- Student usage of computers & internet

OUTPUT
- Teachers/ students having email
- Teachers/ students with ICT certificates
- Students completed ICT courses
- Innovation
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INDICATOR INTERACTION

Evaluation Studies

Examine the interaction between

UTILIZATION

INPUTS

OUTPUTS
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INDICATOR CLASSIFICATION

DIRECT

INDIRECT

QUALITATIVE

QUANTITATIVE

ABSOLUTE

RELATIVE

REGULAR

OCCASIONAL

“Indicators of ICT Usage in Education” IITE
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CORE LIST OF ICT INDICATORS

1. INPUT INDICATORS

A. Classroom ICT resources
   Examples:
   - Availability of electricity
   - Number of devices per school
   - Number of students or teachers per device
   - Numbers of computers connected to the internet

B. Teacher Training
   Examples:
   - Teachers understand technology operations and concepts
   - Teachers can apply technology to facilitate learning/assessment
   - Teachers use technology to enhance their own productivity

C. Classroom Pedagogy
   Examples:
   - Students developing abilities to undertake independent learning
   - Providing learning disabled students with additional instruction
   - Students learning to search for information, process data, and present information

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CORE LIST OF ICT INDICATORS

2. OUTPUT INDICATORS

A. Student knowledge of school subjects
   Examples:
   Increased knowledge in different subjects
   Increased understanding of concepts, principles and problem solving
   Students applying knowledge outside of classroom (real world)

B. Student Attitudes
   Examples:
   Change in motivation and attitude about particular subjects
   Change in attitude towards school and learning

C. Student skills
   Examples:
   Students acquiring ICT skills
   Students acquiring knowledge economy skills

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CORE LIST OF ICT INDICATORS

D. Systemic outcomes
Examples:
Change in student enrollment rates
Change in student pass rates
Change in student dropout rates

E. Teacher outcomes
Examples:
Increased teacher knowledge of ICT
Increased teacher pedagogical knowledge related to integration of ICT
Teachers ability to integrating ICT into the curriculum and assessment

F. Long-term outcomes
Examples:
Higher life satisfaction
Higher income and improved health
Increased economic competitiveness and access to global economy

3. NATIONAL EDUCATIONAL & SOCIO-ECONOMIC INDICATORS

A. National educational context
   Examples:
   - Total public expenditure on education
   - Educational expenditure per student

B. National infrastructure context
   Examples:
   - Households with electricity, radio, computer, internet access
   - Businesses with computers, internet access, a website
   - Schools and government offices with access to the internet

C. National economic & social context
   - UN Millennium Development Goals

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CORE LIST OF ICT INDICATORS

ACCESS INDICATORS

At School:
- Schools having access to computers
- Schools having access to internet
- Student to computer ratio
- Teachers with computer/internet available in their classroom

Outside School:
- Students having computer at home
- Students having internet at home

USE INDICATORS

At School:
- Students used ICT at school/home
- Students used ICT for learning
- Teachers used ICT in their lessons
- Teachers reporting types of learning activities with ICT

Outside School:
- Students using internet outside school
- Locations where students use the internet
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CORE LIST OF ICT INDICATORS

CURRICULUM INDICATORS

- Principals indicating students should have acquired particular ICT skills by end of grade
- Schools indicating typical student would have used ICT applications
- Emerging pedagogical practices
- Schools that used email for instructional purposes
- Emerging ICT related opportunities

HARDWARE & SOFTWARE INDICATORS

- Student to computer ratio
- Schools having computers that are not used
- Multimedia computers for the grade range in computer using schools
- Computers accessible at the grade range connected to a local network
- Schools having access to the internet for instructional purposes
- Schools having their own website
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**CORE LIST OF ICT INDICATORS**

**STAFF DEVELOPMENT INDICATORS**

- Principals indicating school had adopted goals regarding training of teachers
- Schools where certain arrangements were available regarding the transfer of ICT knowledge among teachers
- Schools with available in-house and external courses from a list of 12
- Adequacy of preparation for supporting general ICT-related activities and pedagogical ICT related activities

**MANAGEMENT AND ORGANIZATION INDICATORS**

- Values of principals’ attitudes towards ICT
- School having written policy or statement with regard to ICT use
- Schools having internal common vision of ICT use
- Schools where particular arrangements were made to regulate computer–related activities
- Principals who use computers to track student performance and other data
“The choice of core indicators is the key to determining the impact of technology on student and teacher knowledge, skills and attitudes.

In order to understand the outputs of any program, inputs must also be measured.

Outputs should be measured against these same variables as well as costs.

Data should be collected throughout the program’s implementation, and in sufficient breadth and depth such that conclusions have credibility.”

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ICT INDICATORS USED TO MEASURE VARIOUS VARIABLES
BUT MOST IMPORTANTLY
INDICATORS ARE USED TO MEASURE THE IMPACT OF ICT

ON THE

QUALITY OF
STUDENT LEARNING (PROCESS)
AND ACHIEVEMENT (PRODUCT)
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Development of indicators and measurement of the impact of ICT are very essential BUT only after the development of clear **NATIONAL ICT POLICIES**

that explicitly define the desired outcomes

**ICT policies should regularly be reviewed to ensure they promote proper and appropriate use of technology in teaching, lead to the desired learning outcomes, and provide support to education reform efforts**
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To ensure clarity of purpose and direction in the application of ICT policies

“ADOPT INTERNATIONAL STANDARDS AS THE CRITERIA FOR THE APPLICATION AND USE OF ICT AS A TOOL, AND AS RESOURCES FOR LEARNING” – NES

- ICT Management Policies
- ICT in Education Policy
- Appropriate Use Policy
- E-Content Development/Implementation Policy
- Learning/Teaching/Resources
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SHIFTING FROM ACCESS TO SUCCESS

Shifting more focus towards assessing impact of software inputs (improving curricula, pedagogy, and teacher training)

Perceiving ICT as means to an end
THANK YOU