

ICT4E

Challenges and issues

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(based on work by

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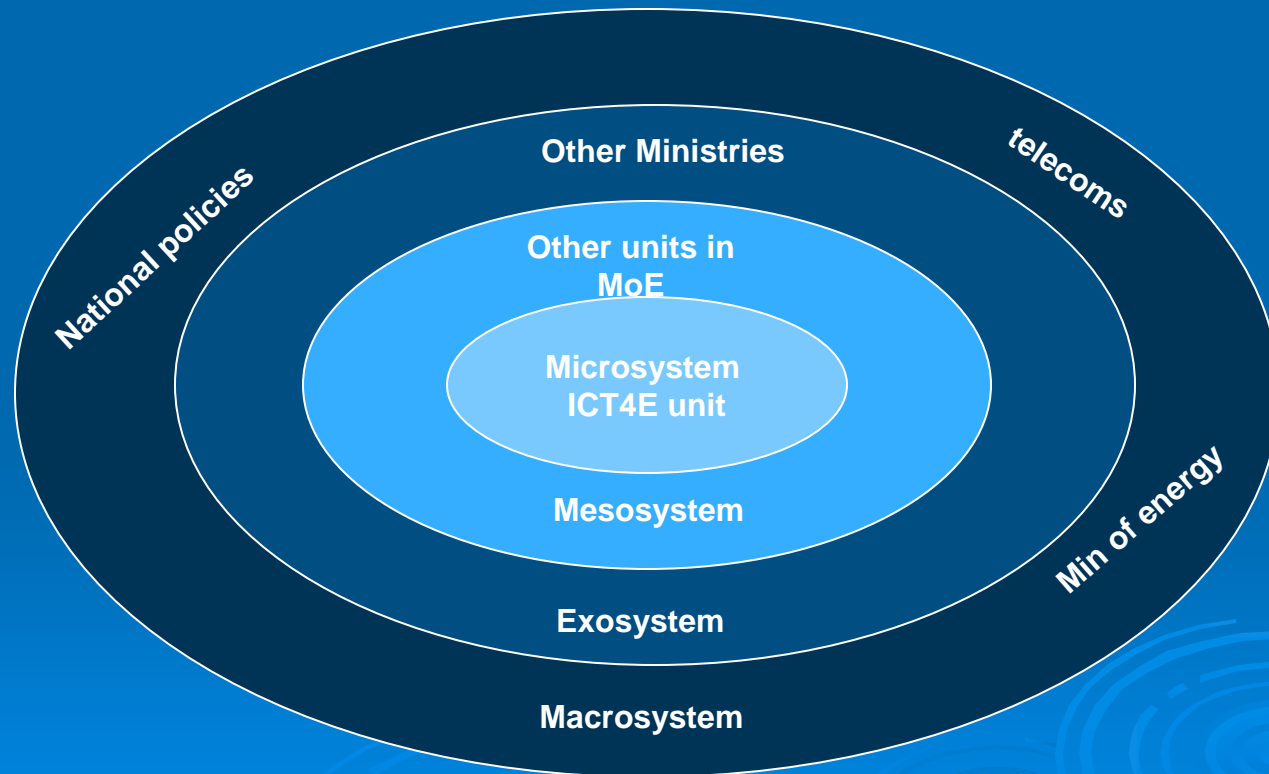
Global e-Schools and Communities Initiative

<http://www.gesci.org>

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MoE – an Ecological approach

- **Ecological Systems Theory**, also called "Development in Context"



GeSCI , 2008

Model developed from Ecological System's Theory, Bronfenner, 1979



Paper Based Media

Assumptions about Learning

- Based on information processing and behaviourist learning theories
- Learning is a transmission of knowledge
- Learning is most effective when planned in a tight programme for the placement of “knowledge bricks” in learners’ minds
- **Linear thinking**



Electronic Digital Media

Assumptions about Learning

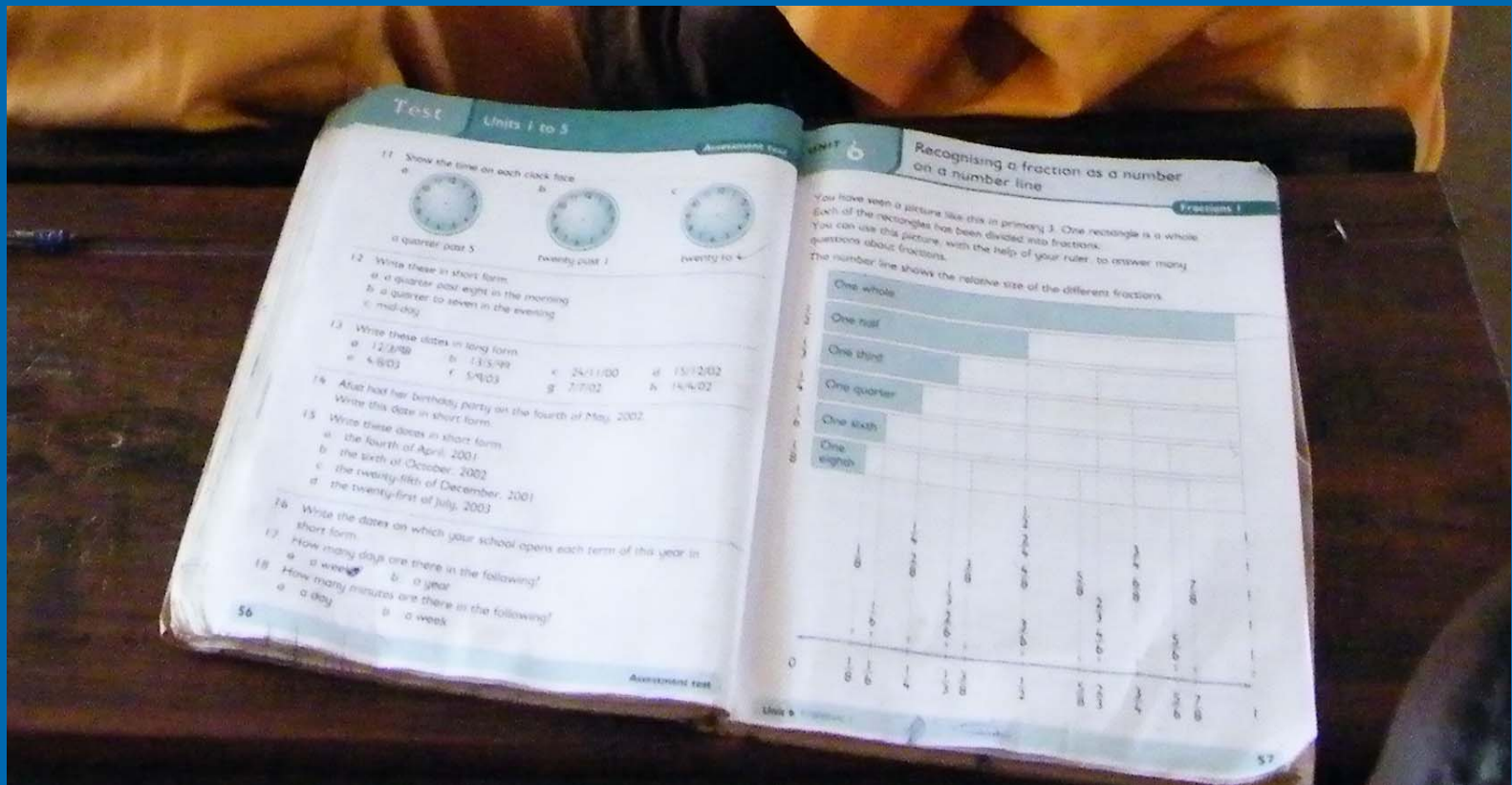
- Based on constructivist learning theory
- Learning is a reconstruction of knowledge
- Learning is most effective when part of an activity the learner experiences individually and/or in groups as constructing a meaningful product
- **Systems thinking** incorporating **feedback** and **adaptation**



One-to-one

Many innovations based on 'open' or 'child-centred' or 'constructivist' or 'radical' education forms have been disappointing because they simply did not go far enough in making the student the *subject* of the process rather than the *object*.

Papert, 2004



Instructionism

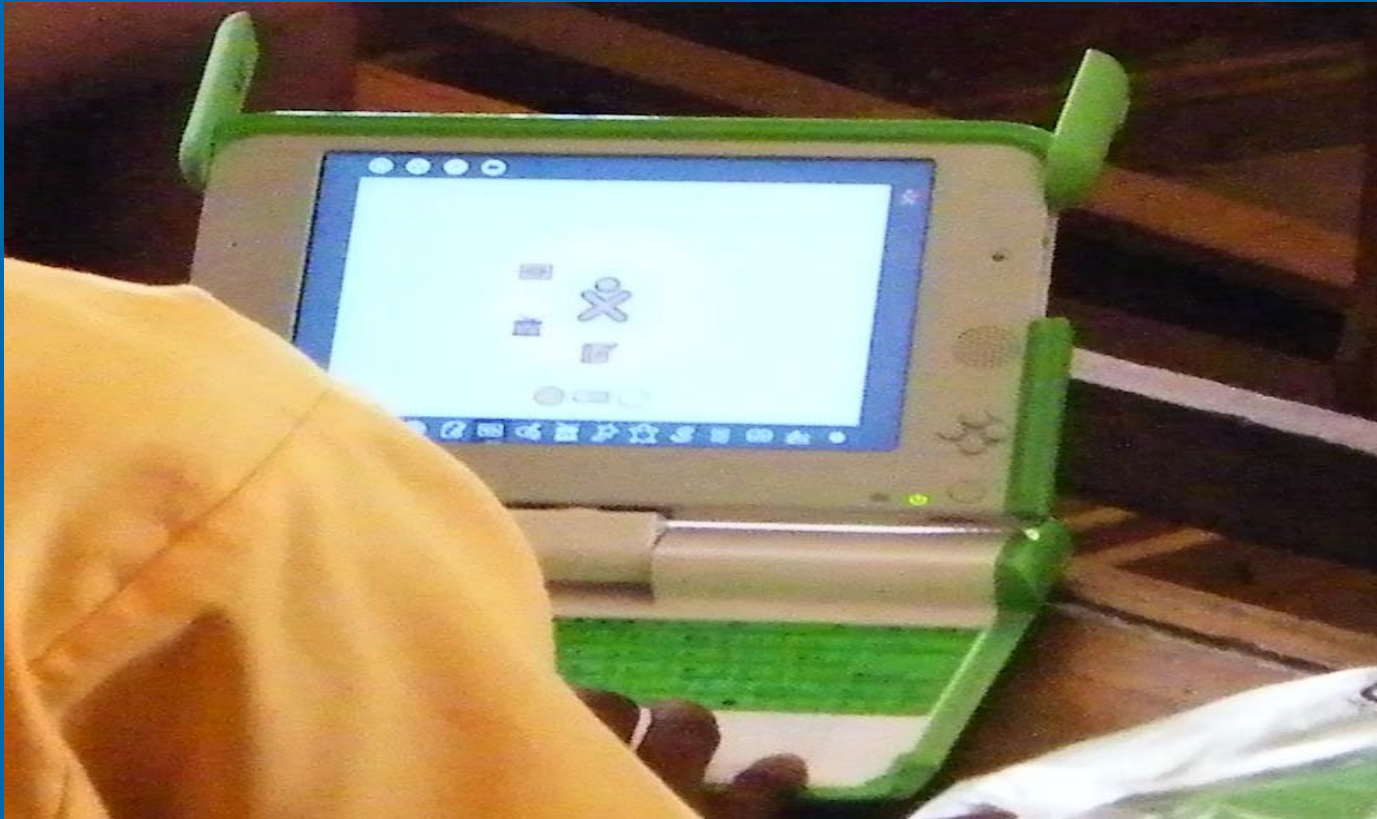
Paper based – Drill and Kill - Static

Learner is passive *object* receiving
knowledge at the end of a
transmission line

Instructionism

Paper Based Media

Electronic Flashcards



Constructionism

Electronic - Microworlds - Dynamic

Learner is active *subject*
constructing knowledge 'in the
head' which is supported by
'construction in the world'

Constructionism

Electronic Digital Media

Interactive Microworlds

- Computer technology can provide interactive tools adequate to the task for enabling new dynamic ways of learning
- Tools such as Logo, a programming language for Mathematics to “really get kids to think in a more fundamental way about thinking in all kinds of contexts, to become strategic thinkers, to become more involved in designing and building knowledge”

Feurzeig cited in Agalianos et al. 2001:480



Instructionism
Paper Based Media



Constructionism
Electronic Digital Media

Reconceptualizing Activity Theory

Instructionism
Technicalizing

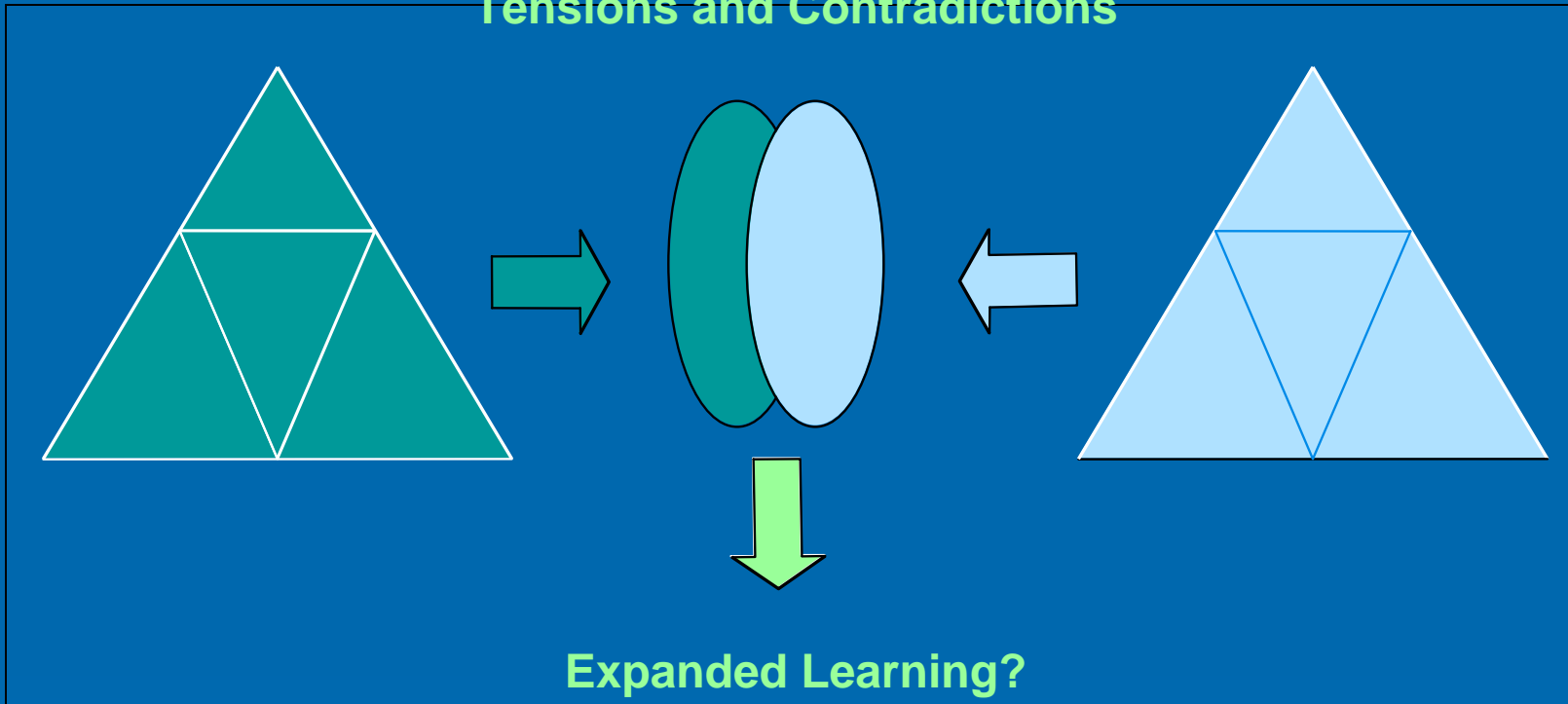
V

Constructionism
Not technicalizing

*The route to better learning is to focus on **improvement of instruction***

*The route to better learning is to focus on how to produce the **most learning for the least teaching***

Boundary Objects Meet Tensions and Contradictions



The central issue of change in education is the tension between technicalizing and not technicalizing, and here the teacher occupies the fulcrum position

Papert, 1993

Ethiopian One-to-one Pilot 2007

Introduction of the *OLPC XO Sugar applications* with *Eduvision Melepo software* digitizing Amharic textbooks into Ethiopian Education System

- **two schools with two 2nd grade classes**
- **twelve teachers**
- **three workshops of training**
- **in class and after class support for a total of fourteen lessons**

Ethiopian Pilot

- Hierarchial instructionist model - educational system “rooted in rote learning”

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- Heterarchial constructionist model - constructionist pedagogical stance embedded in OLPC applications

Tensions and Contradictions

Face-to-face

- Instil politeness and obedience
- Traditional; replicating and perpetuating a rote-based approach
- Pupils "discovering information" indicates teachers "failing"
- Physical setting: facing front, textbooks, blackboard, paper pencil
- Community action: Attendance, discipline and testing
- Teacher in "authority" presenting information for transmission to pupils
- Pupils passive recipients

One-to-one

- Self-controlled learning, group work, dialogue
- "Rules" set by outsiders
- Can undermine teacher's authority
- Classroom setting different; flexible, group, pair and/or individual work
- "Expanded Community" – educational designers, content developers etc
- Teacher's control over classroom "deprivatized" – division of labour shared


Solution

- “Interactive books first, computer literacy and advanced learning methods later”
- “Digitalized interactive local language content familiar to students and teachers can **circumvent much of the resistance** that OLPC’s methodologies have received from local stakeholders”.

Hartel, 2008


Solution

Technicalizing

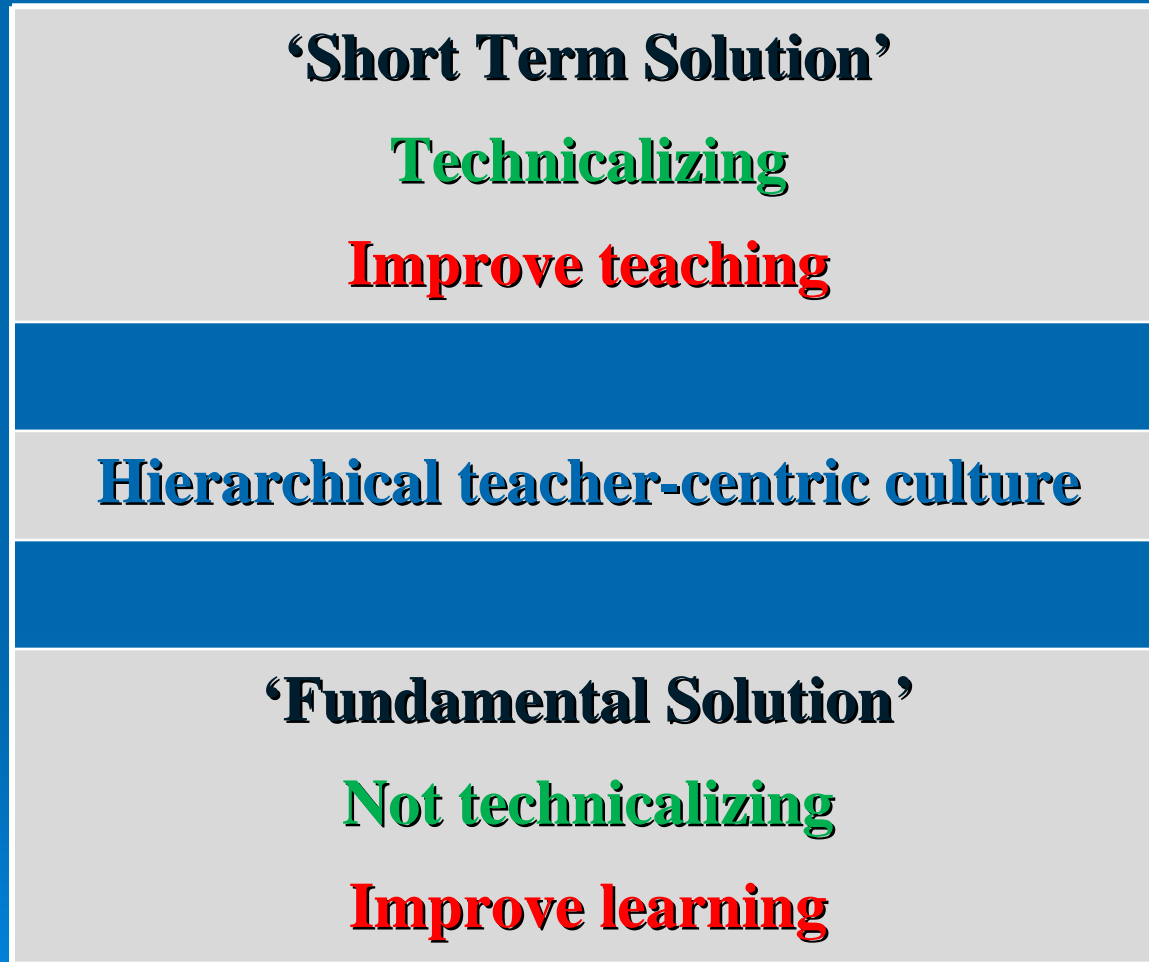
- **Assimilation** of the computer technology to fit into the school way
 - Protect the culture of the local hierarchical teacher-centric practices and curricular organization
 - **Improve teaching**
- 

Solution

Not Technicalizing

- **Accommodation** of the school way to fit into the new dynamics of learning embedded in the computer technology
 - 'Address' rather than 'circumvent' the deep-rooted teacher-centric culture
 - **Improve learning**
- 

Solution



*Side Effects
Dependency
on Projects*

delay

Logo Computer Language

Experiment for dynamic change in mainstream education in the US and UK in the 80s

- “Quick and shallow” mass introduction in the US mainstream
- “Not enough preparation of the teachers who were going to use it or an adequate infrastructure to sustain it as an innovation”
- “Effectively brought back into line with school’s ways” in the UK classroom
- “Became a reinforcing agent of the traditional rather than a vehicle of the new”

Agalianos, 2001

Issue

“Create shared understanding among stakeholders on e-Learning”

What **short term solutions** can address the issue?

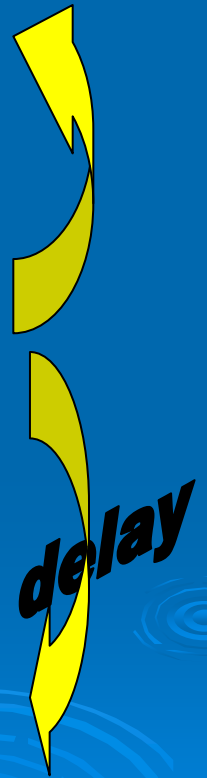
How can the issue be addressed with **more fundamental long term measures**?

‘Short Term Solution’

Challenge

‘Shared Understanding on e-Learning’

‘Fundamental Solution’



Lessons Learned from 1:1 Initiatives

- **Policy issues** which 1:1 computing raises and which require a broad fundamental response framework for:
 - defining objectives,
 - outlining teacher preparation,
 - identifying supportive educational structures and curriculum frameworks,
 - clarifying infrastructure and maintenance
 - pre-empting financial considerations for system wide roll-out.

**Across the world children
have entered a passionate
and enduring love affair with
the computer. Can it be
guided by the older
generation into forms
constructive or destructive?**



**Or is its evolution already out
of our hands?**

**Seymour Papert
The Children's Machine:
Rethinking School in the Age of the Computer**



But the **Big Question** remains:

Who and when will the issues left for
"later" be addressed?

Thank you!



References

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