ICT as a Lever for Student Change and Advancement

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Challenges ahead of Us
## Shifting Paradigms

<table>
<thead>
<tr>
<th>Old paradigm</th>
<th>New paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge is presented objectively to students.</td>
<td>Knowledge is constructed by each individual according to his or her context, but involving others.</td>
</tr>
<tr>
<td>Students study at an educational institution, isolated from the wider community.</td>
<td>Students study wherever it is most convenient: home, work, or in the community.</td>
</tr>
<tr>
<td>The education process is timetabled by an institution and controlled by a teacher.</td>
<td>Learning is accomplished at a time and a place that is convenient to the learner.</td>
</tr>
<tr>
<td>Students are largely dependent on their institution to guide them through their study.</td>
<td>Students are independent and enjoy greater choice when they study.</td>
</tr>
<tr>
<td>Face-to-face teacher/student interaction predominates.</td>
<td>Technologically mediated forms of communication predominate.</td>
</tr>
<tr>
<td>Learners and educators are print oriented.</td>
<td>Learners and educators are multimedia literate.</td>
</tr>
<tr>
<td>Learning in isolation</td>
<td>Learning occurs with others</td>
</tr>
</tbody>
</table>
ICT as a Lever for Student Change and Advancement:

E-learning
What is E-learning?

Electronic learning or e-learning can be technology-enhanced learning and/or technology-delivered learning. As defined by Jackson, R. (2002). Weblearning resources. Retrieved 10 Jan 2003 http://www.knowledgeability.biz/weblearning/#Different%20Shades%20of%20Online
What do you believe constitutes good e-learning?

There are many factors that can influence the e-learning experience:
- Infrastructure.
- Quality of content and assessment.
- Quality of learner support systems.
- Assumptions made by learners and facilitators about the learning experience itself.
- Educational design.
- Peer support networks for learners and facilitators.

• Careful design of quality online learning materials along with learner support and learner activity will encourage deep and more meaningful e-learning.
The role of the learner

Active learning
Choice
Pattern seeking
Chunking

The role of the educator

Meaning and relevance
Emotions
Repetition and rehearsal
Prior knowledge
Adequate time
Immediate feedback
Collaboration
Reflection

The role of the technology

Designing e-learning environments
Teacher-Directed Learning Environment

- Content/syllabus
- Objectives + Educator
- Student
- Product
- Assessment
- Technology

© Albon & Trinidad, 2001
School (or school system)

Classroom

Teacher

Student

Parent

Community (home for this group of students)

The world at large (beyond the community)

Senge, et al., (2000); p.13
The Learning Community

UNIVERSITY
- Lecturer expertise

PEERS
- variety/degrees of knowledge

SCHOOLS
- Reciprocity schools & university

TECHNOLOGY
- email
- WWW- resources, lists, chat grps
- ILN, WEBCT etc
- Databases
- Network/organisations

FAMILIES
- support and encouragement

LIBRARIES
- information
- electronic services
- databases
Linking Learning with Assessment

Assessment is demonstrated through Learning and Interaction, which drives Construction. Learning enables the outcome of Construction, which is the vehicle for Interaction.
Teacher built e-learning environments

- **Green Picnic**

- **Fractions**
  - [http://tiger.hkuspace.org/~bed01g20](http://tiger.hkuspace.org/~bed01g20)

- **Statistics**

- **Water Rockets**
  - [http://mryung.ofhk.net/rocket/index.htm](http://mryung.ofhk.net/rocket/index.htm)

- **Hong Kong under Japanese Occupation**
  - [http://web.hku.hk/~h9230028/6201/index.htm](http://web.hku.hk/~h9230028/6201/index.htm)
Linking to Resources

http://www.hkedcity.net/
This is a pilot project launched by the Standing Committee on Language Education and Research (SCOLAR) and sponsored by the Language Fund to encourage greater use of the medium of television in the teaching and learning of English in secondary schools. It comprises: (a) the broadcasting of two teenage English television programmes titled "Road Scholars" and "Lizzie McGuire" on the TVB Pearl, and (b) the development of teaching and learning materials and activities based on the two television programmes.
E-learning & SARS
E-learning & SARS – what happened?

Class suspension & IT

Universities:

HKU

• http://www.hku.hk/sars/index.shtml
• http://www.hku.hk/cgi-bin/sars/message_announcement.pl

And similarly for other universities

Schools:

• http://ihouse.hkedcity.net/~sp1400/elearn.htm
E-learning & SARS – what happened?

Support from within the education community for the community

• HKU: “Inter-disciplinary Self-Learning Platform”
  http://www.hku.hk/gened/withu/

• CUHK: “Web-based Support for Primary and Secondary Students”
  http://www.fed.cuhk.edu.hk/prisecstudent/html

• Hong Kong EdCity I-classroom “Learning and Teaching Strategies and Resources on ‘Atypical Pneumonia’”
  http://www.hkedcity.net/project/cdi/index_eng.html
E-learning & SARS – what kinds of learning & teaching took place?

- Video conferencing?
- Webcast/chat room?
- Web forum/discussion?

Most popular:
- Repository of notes & ppt
- Delivery of instructions on homework
- Posting of assignments by students
Using E-learning during SARS: Observation 1

IT readiness

• Both teachers & students involvement must have used e-learning before

• Communication platforms & mode of learning & teaching used must have been already set up and used before

• SARS has promoted more extensive uses of IT where it has already taken root

• *IT can increase momentum, not create it!*
Using E-learning during SARS: Observation 2

Conception of e-learning

• The usage is generally very traditional
• IT platforms as communal space for disseminating what is most important in teaching and learning
• Common use of IT tools: listen to teacher explanation, download course materials and submit assignment

Do such uses of IT in learning Help to prepare students for lifelong learning?
Conditions necessary to take advantage of IT during SARS:

• Readiness
• Conception of learning & teaching - & elearning

*IT can only be a lever for improvement and innovation, not a catalyst!*
A Paradigm shift in e-learning?

• Some students’ general opinions on the replacement of face-to-face classroom interaction by learning through IT during the outbreak of SARS:

“Too many assignments!”

“I miss my fellow classmates!”

→ Can technology contribute to learning differently?
Organized by Centre for Information Technology in School and Teacher Education

Peer Tutoring Project

The Plan

Objectives

Challenges of the 21 Century

The Impact of Knowledge Society on Education

How to Join knowledge building

Tips of PTP

Schedule

Important dates of PTP

Consultation hours
Collaborative inquiry-based learning using Knowledge Forum

Knowledge Forum is a computer-supported communal database that furnishes knowledge building and management tools for collaborative inquiry.

Pre-SARS:
Project-based learning (Peer Tutoring Project in July-October 2002)

Post-SARS:
1. International interchange (Hong Kong Toronto Collaboration in March 2003- present): discussion on relationship with parents, cultural similarities and differences for teenagers and the outbreak of SARS
2. Assessment for better learning: students to revise at home and to design the most innovative ways of assessing deep learning
Much needed technology innovation: pedagogically sound e-Learning platforms

- Existing e-learning platform mostly traditional: teacher-centered and learning-resource centered, focusing on delivery, drill & assessment
- Current eLearning platforms are suited for instruction centered and knowledge centered education
- Education Reform emphasizes on ‘Life-long Learning’
- Life-long learning requires collaborative learning skills, problem-solving techniques and inquiry skills
- Current e-learning platforms cannot support this change effectively – we need innovation in e-learning platforms!
E-learning – a lever for education innovations

To summarize:
1. Conditions necessary for taking advantage of IT:
   * readiness
   * conception of e-learning
2. A paradigm shift in e-learning is necessary
3. A need for technology-innovation:
   e-learning platforms that would support collaborative inquiry
SITES M2: an international comparative case study of innovative pedagogical practices using technology
Emerging pedagogical paradigm

Second International Information Technology in Education Study conducted under the auspices of International Association for the Evaluation of Educational Achievement

http://sitesdatabase.cite.hku.hk/online/index.asp
Innovation & the future of schooling

Why introduce ICT into the curriculum?
• About ICT - as a subject of study
• With ICT - make learning more effective
• Through ICT - new goals & new processes in education for the information society/knowledge economy

Education & societal change:
Apprenticeship $\rightarrow$ standardized production
$\rightarrow$ produce knowledge workers
21st century competencies?

- Premise: new abilities needed for the knowledge society

- Lifelong learning ability – ability to face new challenges, tackle & refine problems, seek new information, learn new knowledge and skills to solve new problems or seek new ways of solving old problems

- Ability to use ICT for all facets of life, for work or leisure, professional or social purposes
New Learning goals require new pedagogical practices

“The traditional classroom …… is singularly ill suited to producing lifelong learners: Right now, you’ve got 30 little workers who come into a room, sit in rows, follow instructions from a boss, and can’t talk to one another. School is the last time they’ll ever see that model.”

(Corcoran, 1993)
SITES M2 – innovative pedagogical practices using technology (IPPUTTs)

Selection criteria:

• In which technology plays a substantial role

• evidence of significant changes in roles of teachers and students, the goals of the curriculum, assessment practices, and/or the educational materials or infrastructure

• shows evidence of measurable positive student outcomes

• sustainable and transferable
SITES M2 - “Innovative” as locally defined

• Promote active and independent learning
• competencies and technological skills to search for, organize, and analyze information, and communicate and express their ideas
• collaborative, project-based learning involving complex, extended, real-world-like problems
• individualized, customized instruction
• Address issues of equity, incl. gender, ethnic, geographic or socioeconomic
• “Break down the walls” of the classroom: time, space, who participates in teaching
• Improve social cohesiveness and understanding
IPPUTs: Pedagogical characteristics

- extended learning task over a period of months
- deeply engaging, personally meaningful/relevant for learners
- involvement of significant others outside of the classroom in the learning process
- availability of suitable facilitation.
# SITES M2 Data

## 174 Cases Reports

### 28 participating countries

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<thead>
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<th>Australia</th>
<th>Italy</th>
<th>Russia</th>
</tr>
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<td>Singapore</td>
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<td>France</td>
<td>Netherlands</td>
<td>Spain Catalonia</td>
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<tr>
<td>Hong Kong</td>
<td>Norway</td>
<td>Taiwan</td>
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<td>UK</td>
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<tr>
<td></td>
<td></td>
<td>USA</td>
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</table>
Focus of Analysis

How do we compare innovations?

6 dimensions of comparison

- Goals
- Teacher’s Role
- Students’ Role
- ICT used
- Connectedness
- Manifestation of Learning Outcome
6 dimensions to compare innovativeness

1. Goals

- Subject-based knowledge
- Higher Order Thinking
- Ability to function effectively as members of a learning community

2. Teacher’s Role (Belief towards teaching and learning)

- Transmitter of information and evaluator of learning
- Design learning tasks; provide resource for learning
- Coach to establish and support the development of learning communities

3. Students’ Role

- Follow instructions
- Determine learning strategies and schedule
- Develop own learning goals, learning strategy, self monitor & evaluate, contribute to communal knowledge building

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### 6 dimensions to compare innovativeness

#### 4. ICT used

<table>
<thead>
<tr>
<th>No ICT used</th>
<th>General software for classroom presentation</th>
<th>Sophisticated technology tailored for specific educational purposes</th>
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<td><strong>Sophisticated</strong></td>
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<td><strong>technology</strong></td>
<td></td>
<td><strong>knowledge, skills, abilities and attitudes</strong></td>
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<td><strong>operating in concert</strong></td>
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<td><strong>technology</strong></td>
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<td><strong>for complex problem</strong></td>
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<tr>
<td><strong>tailored</strong></td>
<td></td>
<td><strong>solving</strong></td>
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#### 5. Manifestation of Learning Outcome

<table>
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<th>Unidimensional</th>
<th>Multiple ways to assess learning outcomes</th>
<th>Multidimensional; knowledge, skills, abilities and attitudes operating in concert for complex problem solving</th>
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#### 6. Connectedness

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<th>Standalone classroom</th>
<th>Partial involvement of outsiders</th>
<th>Multiple ways of involving outsiders in the curriculum process</th>
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<td></td>
<td></td>
<td><strong>process</strong></td>
</tr>
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**CITE**

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CN003

• Subject(s): Art/Music
• Level: Primary
• Type of Practice: Media Production
• Role of Teacher(s): Administer Learning Tasks
• Role of Students: Productive Learning
CN003

T: Coach for Building a Learning Community
Ss: Contribute to Knowledge Building
Goal: Members of Learning Community
Outcome: Multidimensional

ICT: Specific/Sophisticated

Broad Community

Standalone

ICT: None

Outcome: Unidimensional

Goal: Knowledge
Ss: Follow Instruction
T: Presenter & Evaluator
Cinderella is Just-In-Time: Authentic Learning in the Middle Years Classroom Using On-Line Multimedia Technology

AU001

• Subject(s): Cross Disciplinary, Chinese/ Mother Tongue, History
• Level: Lower Secondary
• Type of Practice: Project
• Role of Teacher(s): Guiding Collaborative Enquiry
• Role of Students: Enquiry-Based Learning
IL006

• Subject(s): Cross Disciplinary
• Level: Upper Secondary
• Type of Practice: Media Production
• Role of Teacher(s): Provide Learning Resources
• Role of Students: Online Enquiry-based Learning
IL006

T: Coach for Building a Learning Community
Ss: Contribute to Knowledge Building
Goal: Members of Learning Community
Outcome: Multidimensional
ICT: Specific/Sophisticated

Broad Community
ICT: None
Outcome: Unidimensional
Goal: Knowledge
Ss: Follow Instruction
T: Presenter & Evaluator

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Some observations

• The 6 dimensions are not mutually independent.
• The extent of innovativeness along the 6 dimensions could be very different.
• The teacher’s role may not be innovative at all for some of the cases.
• **Teacher’s roles is a focal dimension** as it orchestrates the other dimensions.
• Where the teacher’s role remained traditional, the innovations along other dimensions also created new demands on the teacher.
To sum up ...

- Irrespective of whether there were substantial changes in the pedagogical roles played by the teacher, the teacher had to innovate at a professional level to meet new challenges in order to realize the classroom innovation.

- Teachers had to engage in lifelong learning & work collaboratively with other teachers.
Innovative Classroom Practices and the Teacher of the Future

It is through pedagogical innovations that the teaching profession renews and recreates itself into a variety of education professionals in the 21st century.
ICT as a Lever for Teacher Change and Development