IT as a Lever for Change in Teaching and Learning

Sue Trinidad
sue@cite.hku.hk

Nancy Law
nancy@cite.hku.hk

Centre for Information Technology in Education
University of Hong Kong
http://www.cite.hku.hk

Centre for Information Technology in School and Teacher Education

Overview

- This presentation will focus on the exciting use of e-learning and how it can become a lever for change in teaching and learning.
- What are the conditions necessary for the benefits of e-learning to be realized?
- What components are necessary to create a suitable e-learning environment?
- What skills do educators need to build suitable e-learning environments?
- These questions will be addressed through:
  1. Examples of e-learning environments that Hong Kong teachers have created will be provided, as will innovations that can help lever change, especially as was noted during SARS.
  2. Findings from an international comparative study of innovative pedagogical practices using ICT.
- Participants will be encouraged to share their own e-learning experiences and contribute to the discussion of e-learning as a lever for change
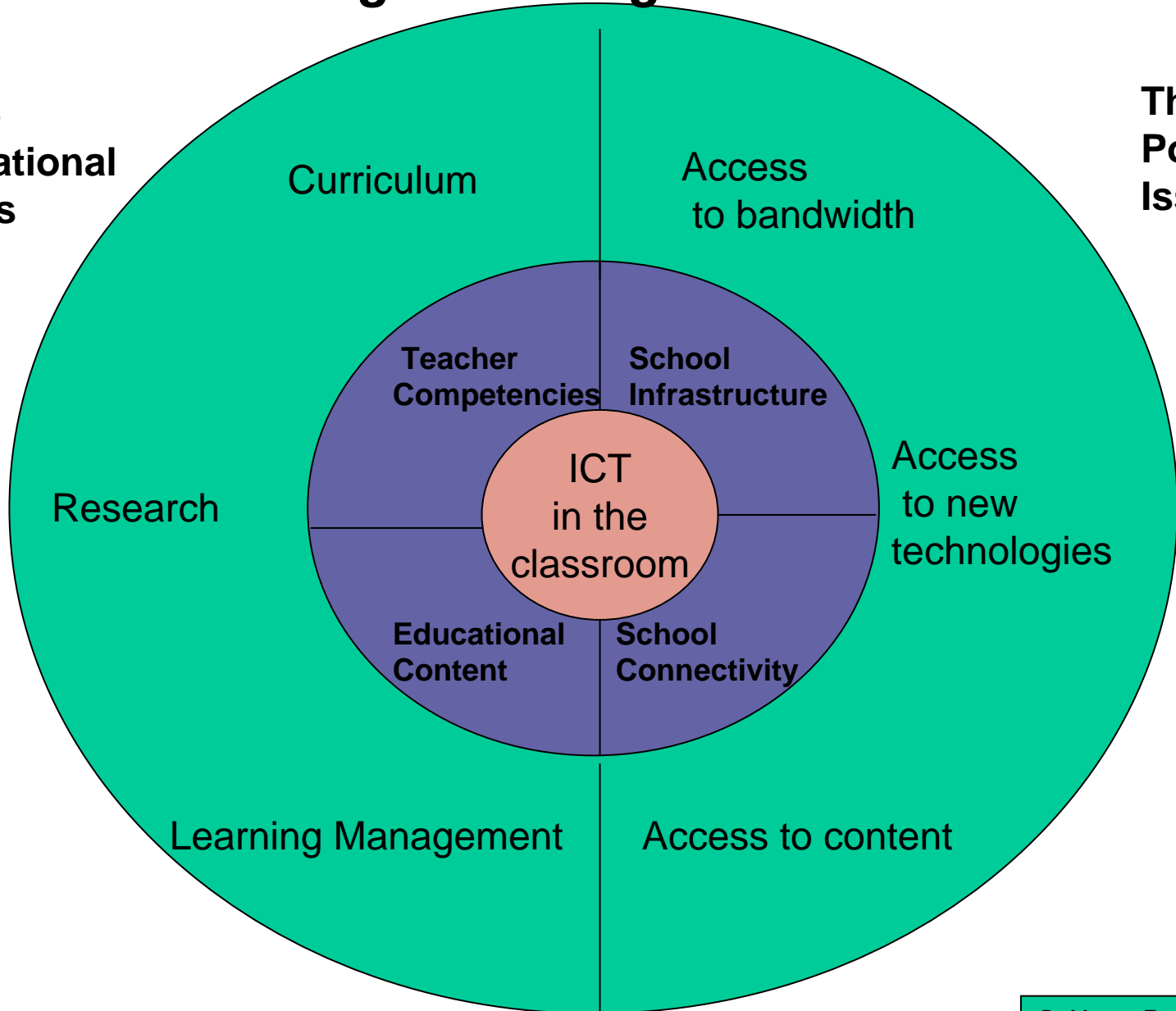
Challenges ahead of Us

Strategic challenges ahead of us

Three Educational Issues

Three Policy Issues

Curriculum

Access to bandwidth

Teacher Competencies

School Infrastructure

ICT in the classroom

Research

Access to new technologies

Educational Content

School Connectivity

Learning Management

Access to content

Dealing with key market players

Shifting Paradigms or Levers for Change

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

IT as a Lever for Change in Teaching and Learning :

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

The role of the educator

Nelson K. (2001). *Teaching in the Cyberage:Linking the Internet and Brain Theory*. Arlington Height, Illinois: Skylight Training and Publishing. ISBN 1-57517-330-1. Is recommended as an excellent text to help develop online content and e-learning modules.

Active learning

Choice

Pattern seeking

Chunking

Meaning and relevance

Emotions

Repetition and rehearsal

Prior knowledge

Adequate time

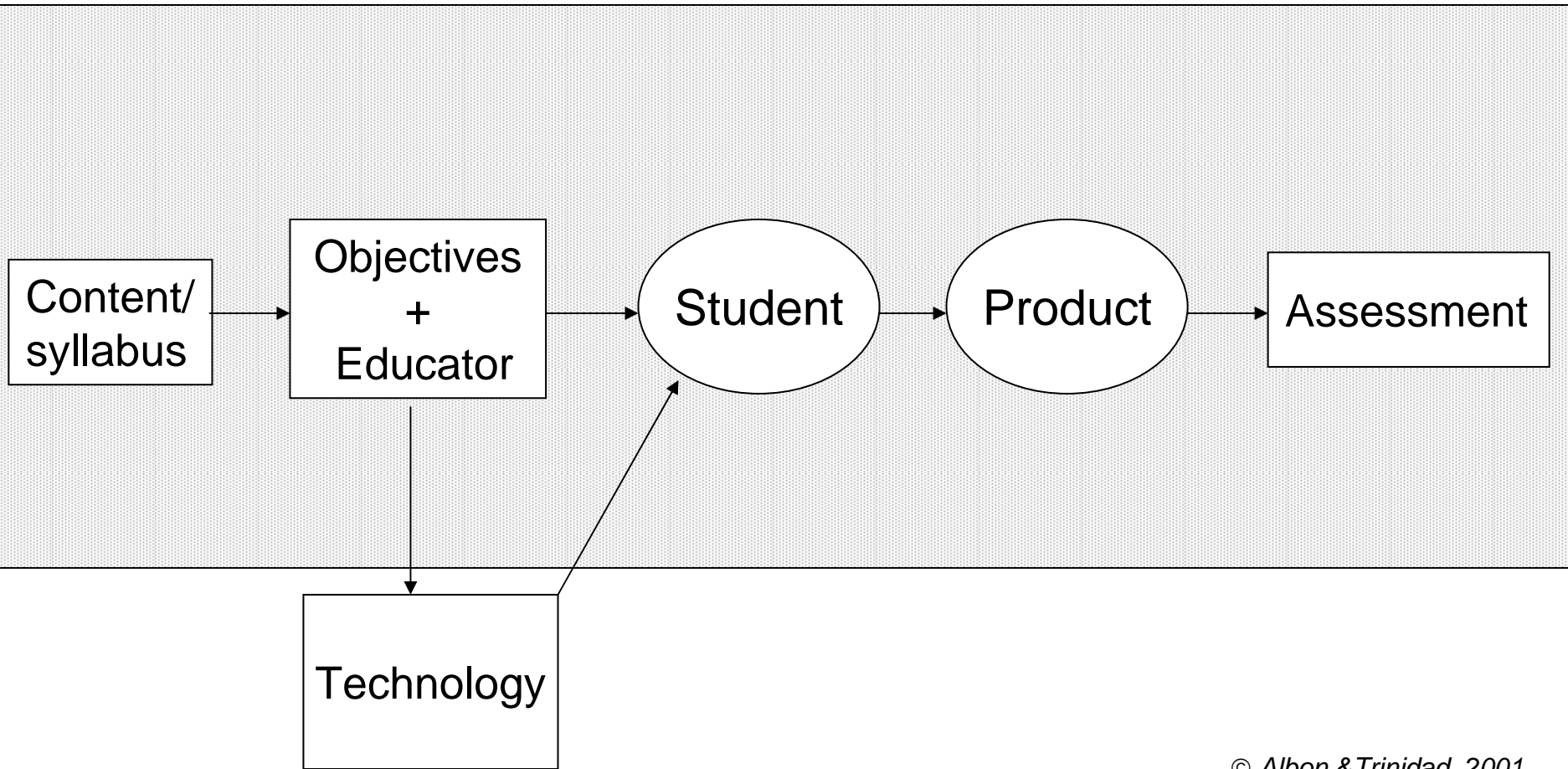**Immediate feedback**

Collaboration

Reflection

The role of the technology

IT as a Lever for Change in Teaching and Learning :

Designing e-learning environments

Teacher-Directed Learning Environment

```
Content/          Objectives          Student          Product          Assessment
syllabus     →        +          →                →                →
                   Educator

                      ↓                   ↑
                  Technology
```

The Learning Community

UNIVERSITY
- Lecturer expertise

PEERS
- variety/degrees of knowledge

SCHOOLS
- Reciprocity schools & university

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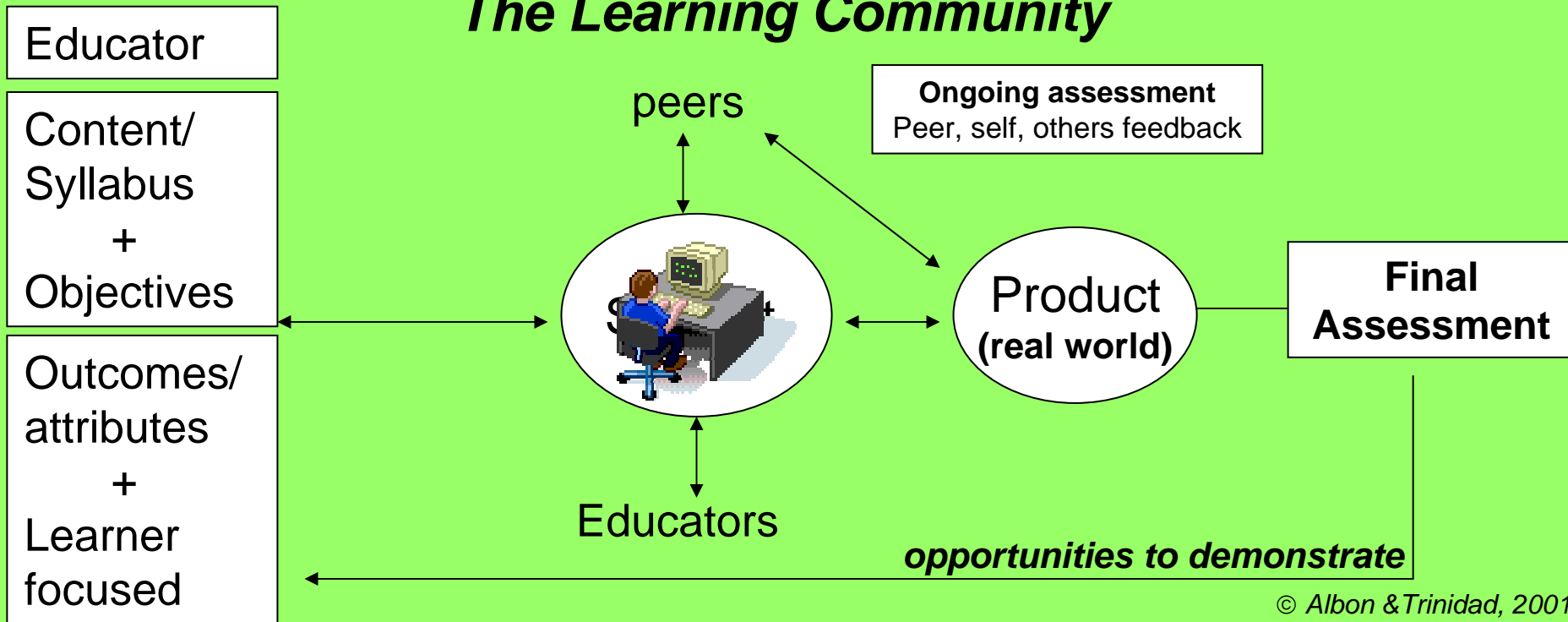- Network/organisations

FAMILIES
- support and encouragement

LIBRARIES
- information
- electronic services
- databases

Technology *drives* the model, assessment *drives* the learning
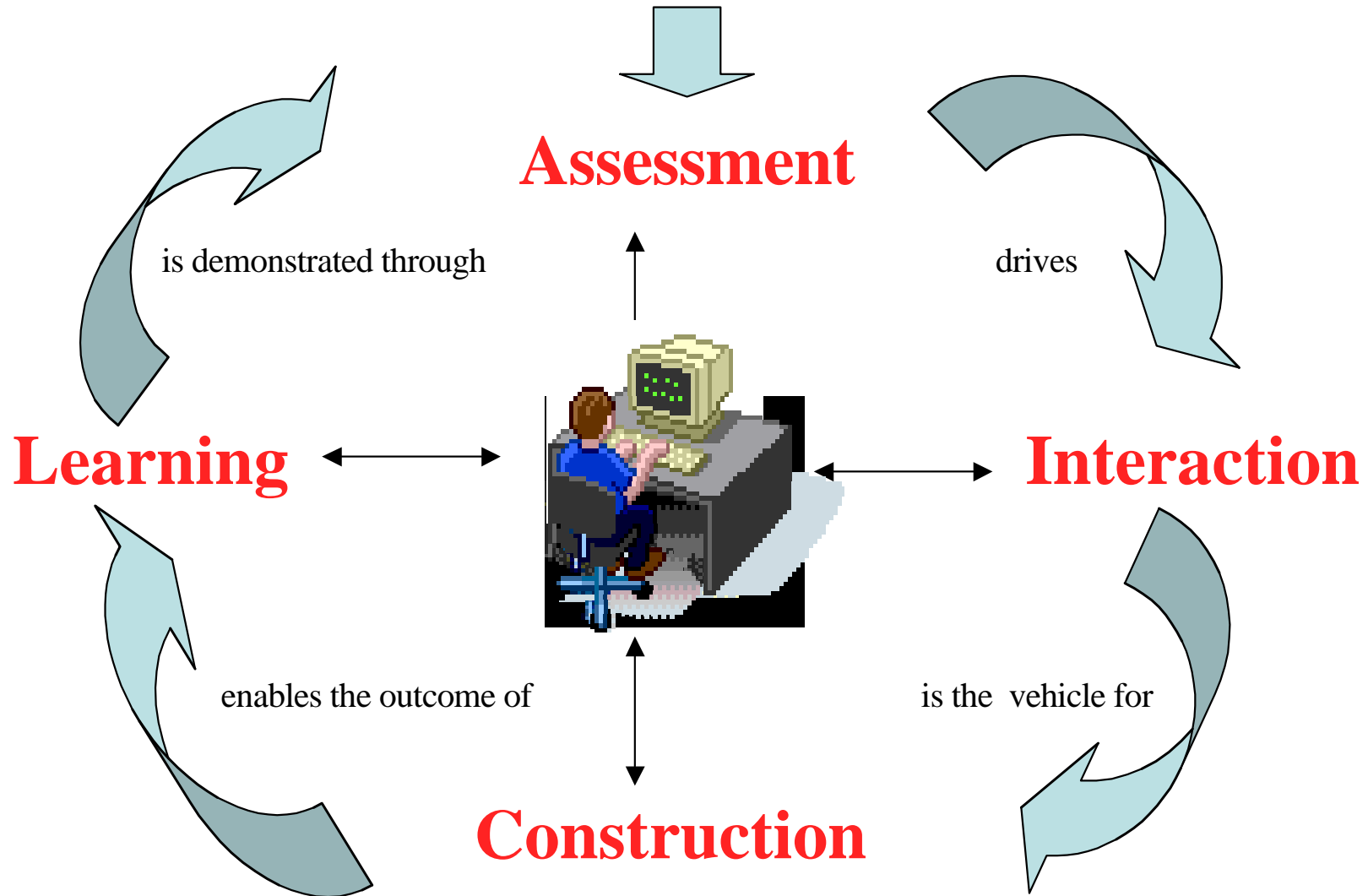
Mediated Learner Approach (MLA)

The Learning Community

Educator

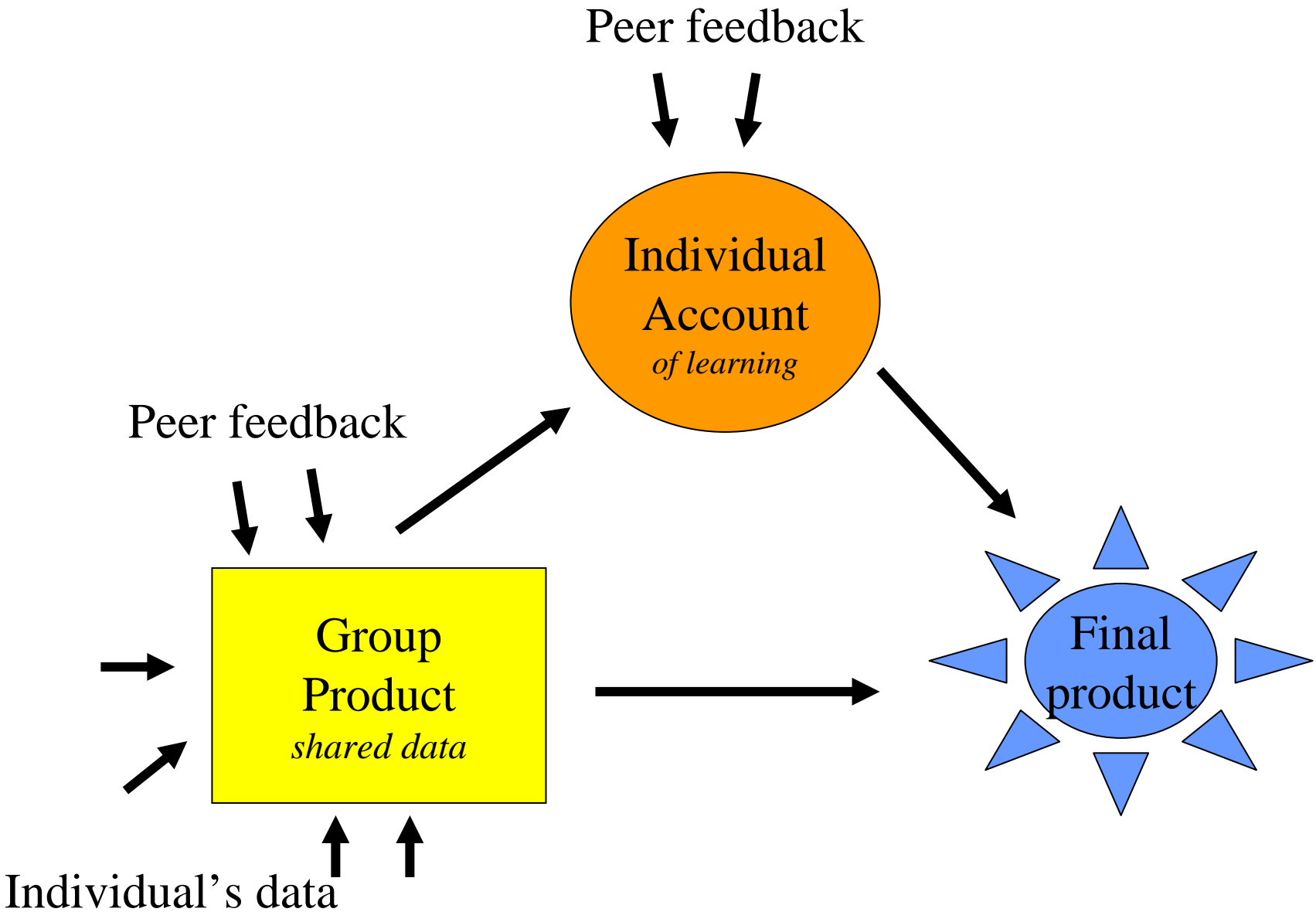Content/
Syllabus
+
Objectives

Outcomes/
attributes
+
Learner
focused

peers

Ongoing assessment
Peer, self, others feedback

Product
(real world)

**Final
Assessment**

Educators

opportunities to demonstrate

© *Albon &Trinidad, 2001*

Linking Learning with Assessment

Assessment

is demonstrated through

drives

Learning

Interaction

enables the outcome of

is the vehicle for

Construction

Using Learner Management Systems

Peer feedback

Individual
Account
of learning

Peer feedback

Group
Product
shared data

Final
product

Individual's data

Teacher built e-learning environments

- **Green Picnic**
- http://www.rcgs.edu.hk/internet/index.html
- **Fractions**
- http://tiger.hkuspace.org/~bed01g20
- **Statistics**
- http://www.hkedcity.net/ihouse_tools/ihouse.phtml?id=ma7749&pa=ma7749&pa=
- **Water Rockets**
- http://mryung.ofhk.net/rocket/index.htm
- **Hong Kong under Japanese Occupation**
- http://web.hku.hk/~h9230028/6201/index.htm
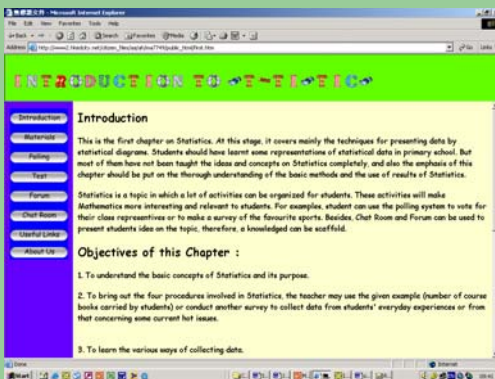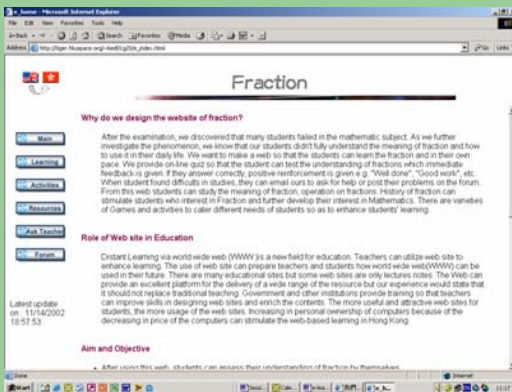
Helping Teachers with Curriculum Reform
http://web.hku.hk/~h0197727/mite6201/

Linking to Resources
http://www.hkedcity.net/
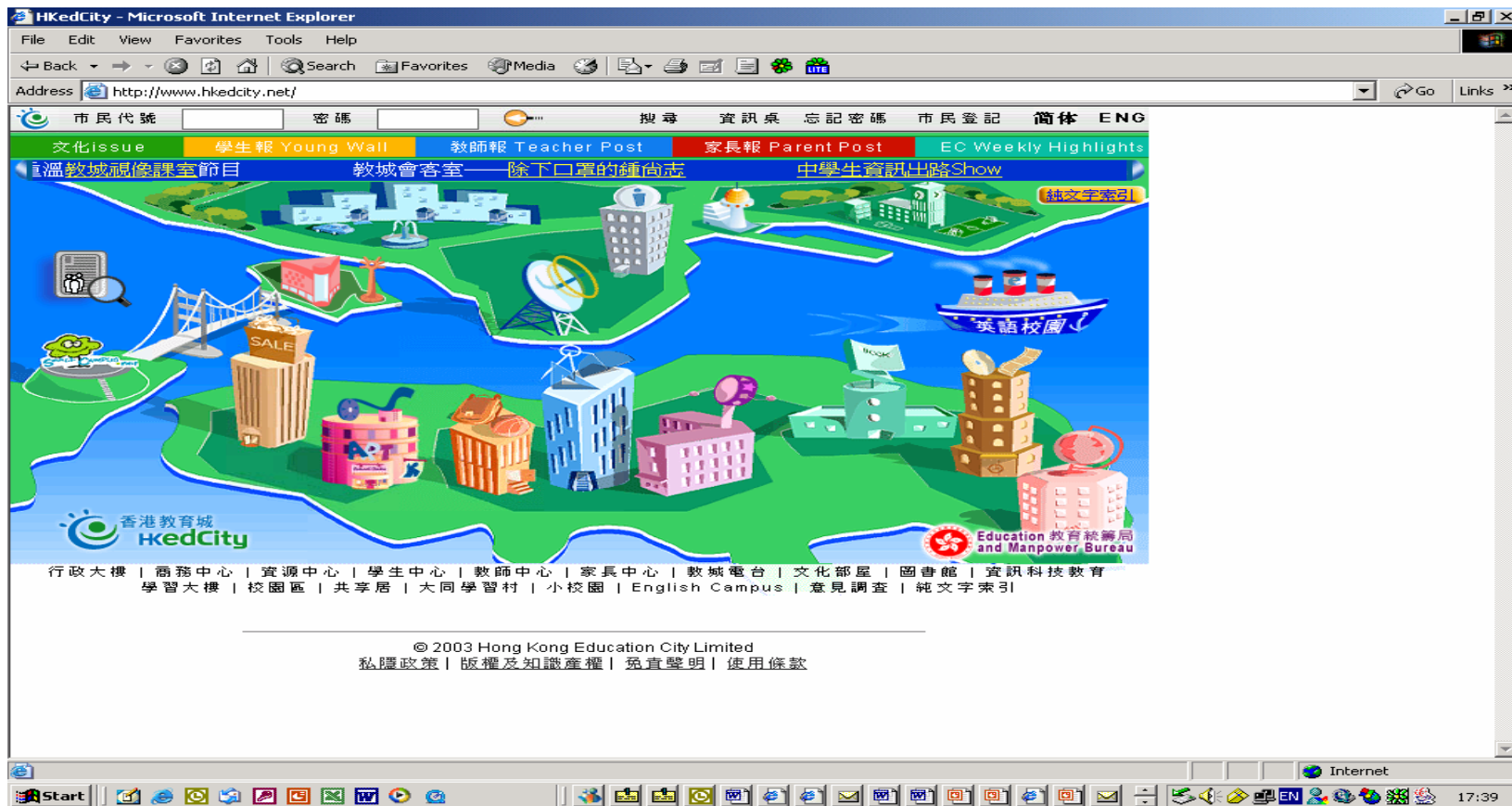
hkedcity.net

English in the Air
http://www.hkedcity.net/english/tv/

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.
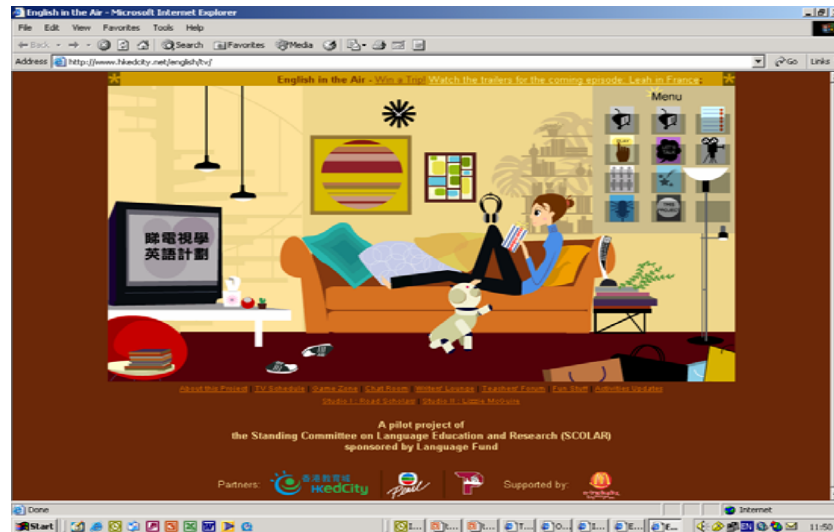
IT as a Lever for Change in Teaching and Learning:

E-learning & SARS

E-learning & SARS

Three Observations:

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

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?*

File　Edit　Objects　Go　Text　Windows　Editor　Help

Views | New Note | Connections | My Reader | Display Tool | Search | Media

Organized by Centre for Information Technology in School and Teacher Education

Peer Tutoring Project

The Plan

Objectives

Welcome

(PTP) Knowledge building

(PTP) Awards and winners

課　程　發　展　路　向

Challenges of the 21 Century
johnny

the impact of knowledge society on education
johnny

learn to learn and knowledge building
johnny

how to join knowledge building
johnny

Aims of PTP
johnny

Schedule

Important dates of PTP
johnny

Consultation hours
johnny

學　會　學　習

終　身　學　習　全　人　發　展

課程發展議會
二〇〇一年六月

中華人民共和國香港特別行政區

Scaffolds | Keywords | Problem | i | Notes and Views

Views | **New Note** | **Connections** | **My Reader** | **Display Tool** | **Search** | **Media**
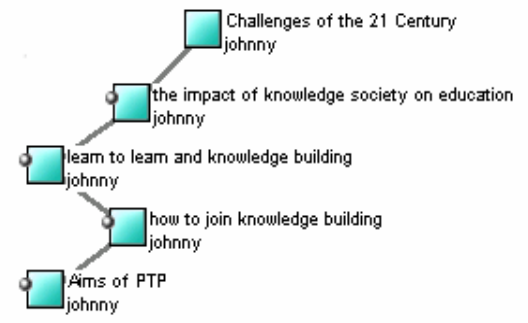
Knowledge Building and Knowledge Forum

→ Welcome　　→ (PTP) The Plan　　→ (PTP) Awards and winners

Welcome to
KNOWLEDGE
FORUM®
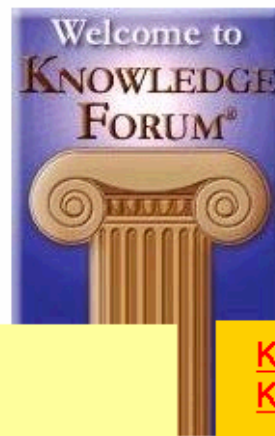
KF's Function and Collaborative Knowedge Building

A Note in KF
johnny

The problem under discussion
elaine

Insert pictures in notes
johnny

Using Views

usage of VIEWS
elaine

add VIEWS as discussion progress in
elaine

add pictures and graphics onto views
elaine

All types of scaffolds
elaine

the BUILD ON !! - Johnny

File　Edit　Objects　Go　Text　Window　Editor　Help

Theory Building | Problem | Why my note cannot link up other note?

My theory
I need to underst
New information
This theory cann
A better theory
Putting our know

Welcome to
KNOWLEDG
FORUM®

The fact is You need to press the BUILD ON button at the bottom of this note window in order to respond to other note.

Example when I press the BUILD ON button to respond to this note, you see a new note linked to this with a title "Response to"

Keywords | → | BUILD ON

Edit → | Scaffolds | Build On | i | Connections |　　　　Close

Using Scaffolds
johnny

Using Rise-above

use of rise-above notes
johnny

use rise-above to summarize notes in discussio
johnny

you can open the original notes in a rise-above note
johnny

double click on the notes to read notes stored in the rise-abov
johnny

highlight suitable keywords
elaine

🔒 | Scaffolds | Keywords | Problem | i | Notes and Views ▾ |

File   Edit   Objects   Go   Text   Windows   Editor   Help

Views | **New Note** | **Connections** | **My Reader** | **Display Tool** | **Search** | **Media**

Relay to the material that made up the satellite.
MFS 4C Yeung Kit Ling

Re: What is satellite?
MFS 4D LAU SIU TING

Satellites are expensive!!
MFS 4C Ku Ching Man

price is not so important
MFS 4C Lo Yee Shan

Reply...
MFS 4C Yeung Kit Ling

Fuel of satellite
MFS 4C Li Cheuk Ying

How do you think?
MFS 4C Yeung Kit Ling

New sources of energy
MFS 4C Yeung Kit Ling

Maybe...
MFS 4D LAU SIU TING

Satellites in space
MFS 4C Ku Ching Man

distribution of satellites
MFS 4C Yeung Kit Ling

cycle,orbit
MFS 4C Yeung Kit Ling

Newton 's first Law
MFS 4C Yeung Kit Ling

come back to earth
MFS 4C Li Cheuk Ying

Where will the satellites be put after used?
MFS 4C Lo Wing Yan

what you mean?
MFS 4C Ku Ching Man

Satellite
MFS 4C Lo Wing Yan

remain there
MFS 4C Ku Ching Man

Against : not remain there!
MFS 4C Yeung Kit Ling

rubbish
MFS 4D LAU SIU TING

space rubbish
MFS 4C Ku Ching Man

Space Junk
MFS 4C Li Cheuk Ying

The earth
MFS 4C Ku Ching Man

Damage?
MFS 4D LAU SIU TING

how can they transfer back?
MFS 4C Lo Yee Shan

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 centred 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

IT as a Lever for Change in Teaching and Learning :

SITES M2: an international comparative case study of innovative pedagogical practices using technology

Emerging pedagogical paradigm

Second International **I**nformation **T**echnology in **E**ducation **S**tudy   conducted under the auspices of

International Association for the **E**valuation of Educational **A**chievement

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 → standardized production

→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 (IPPUTs)

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

		Russia
Australia	**Italy**	**Singapore**
Canada	**Japan**	**Slovakia**
Chile	**Korea**	**Slovenia**
Denmark	**Latvia**	**South Africa**
Finland	**Lithuania**	**Spain Catalonia**
France	**Netherlands**	**Taiwan**
Hong Kong	**Norway**	**Thailand**
Indonesia	**Philippines**	**UK**
Israel	**Portugal**	**USA**

Focus of Analysis

How do we compare innovations?

Practices / Technology	Old	New
Old		
New		

6 dimensions of comparison

Goals

Teacher's Role

Students' Role

ICT used

Manifestation of Learning Outcome

Connectedness

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

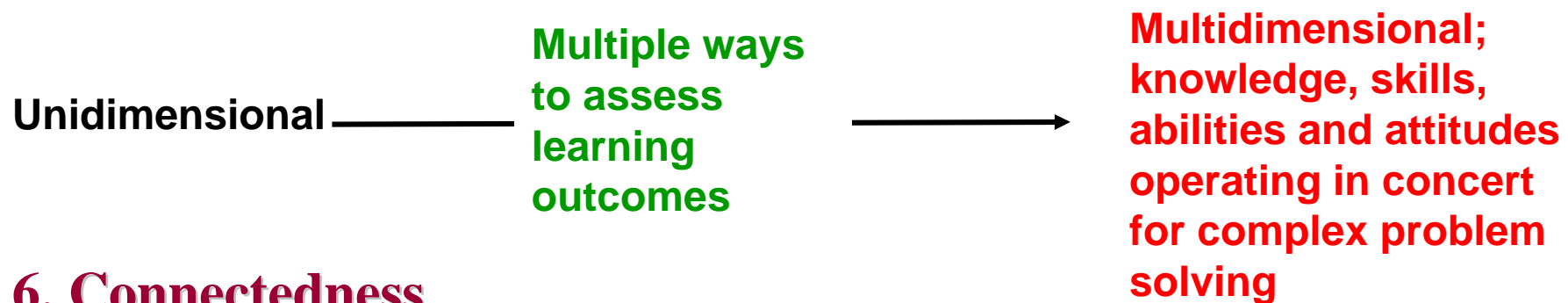**Follow instructions** ——————— **Determine learning strategies and schedule** ⟶ **Develop own learning goals, learning strategy, self monitor & evaluate contribute to communal knowledge building**

6 dimensions to compare innovativeness

4. ICT used

No ICT used ——→ **General software for classroom presentation** ——→ **Sophisticated technology tailored for specific educational purposes**

5. Manifestation of Learning Outcome

Unidimensional —— **Multiple ways to assess learning outcomes** ——→ **Multidimensional; knowledge, skills, abilities and attitudes operating in concert for complex problem solving**

6. Connectedness

Standalone classroom ——→ **Partial involvement of outsiders** ——→ **Multiple ways of involving outsiders in the curriculum process**

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.

NOW

And for those wishing to learn more please join us at the

Information Session for MSc[ITE] & PCAdvEdStud - Responding to Change in Education: IT as a Lever for Innovation
Date: 06 September 2003
Time: 2:30pm -4:00pm
Venue: Rm 101, Runme Shaw Building, The University of Hong Kong
Speaker: Dr. Bob Fox

Centre for Information Technology in School and Teacher Education