

# *ICT as a Lever for Student Change and Advancement*

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# Challenges ahead of Us



# *Shifting Paradigms*

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

# *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

# 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

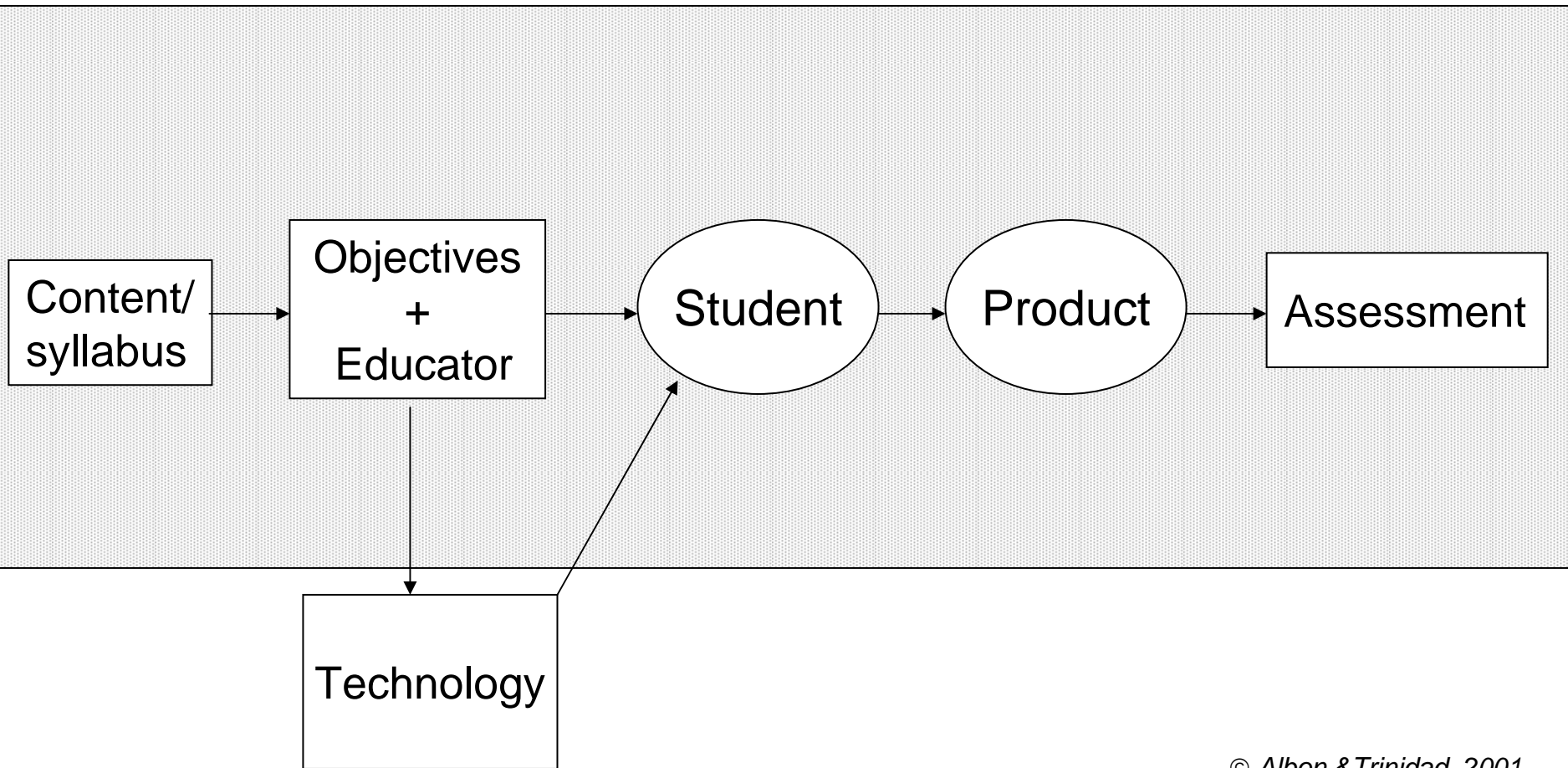
# The role of the technology

# Designing e-learning environments

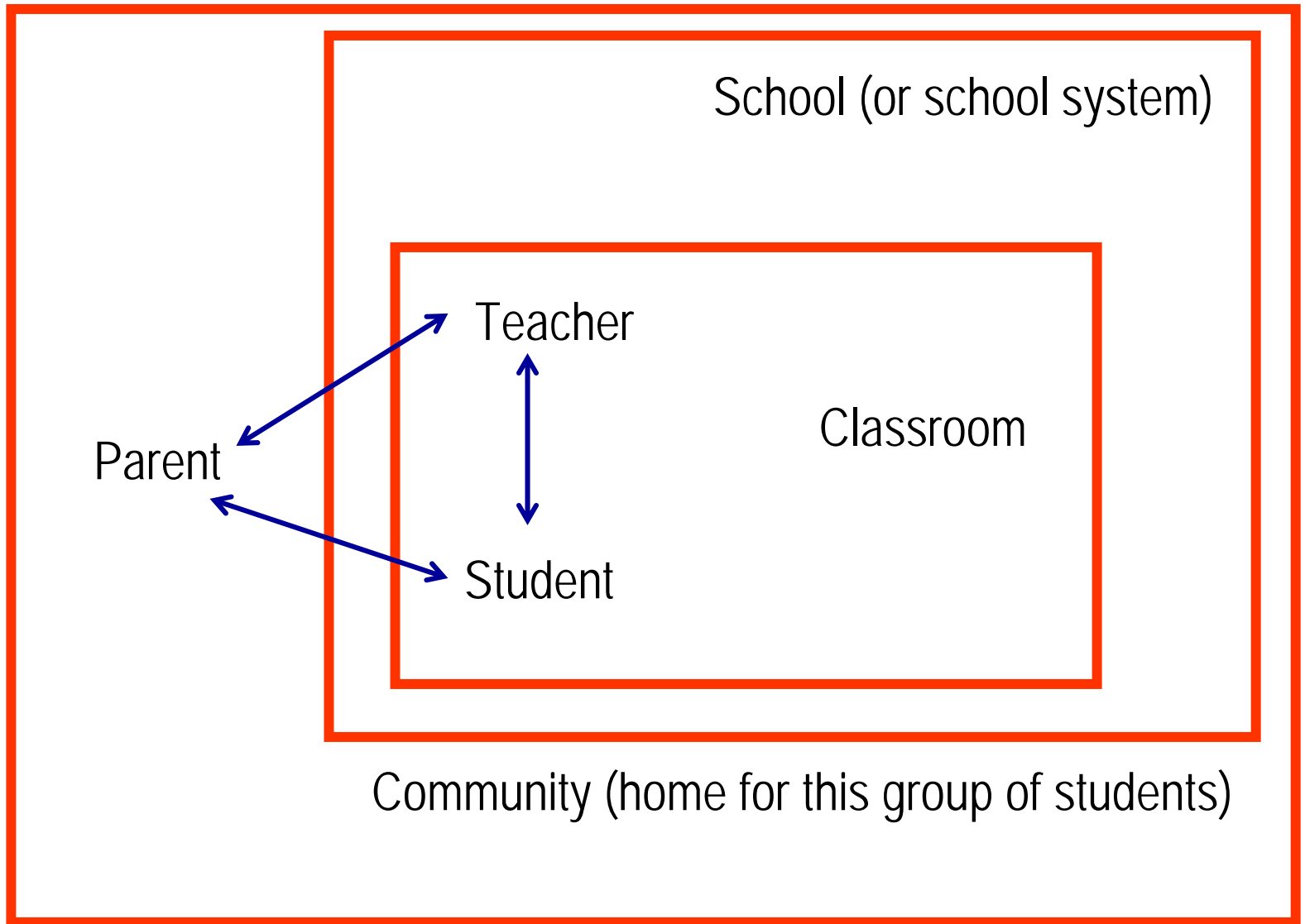




# Teacher-Directed Learning Environment



© Albon & Trinidad, 2001



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

## TECHNOLGY

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

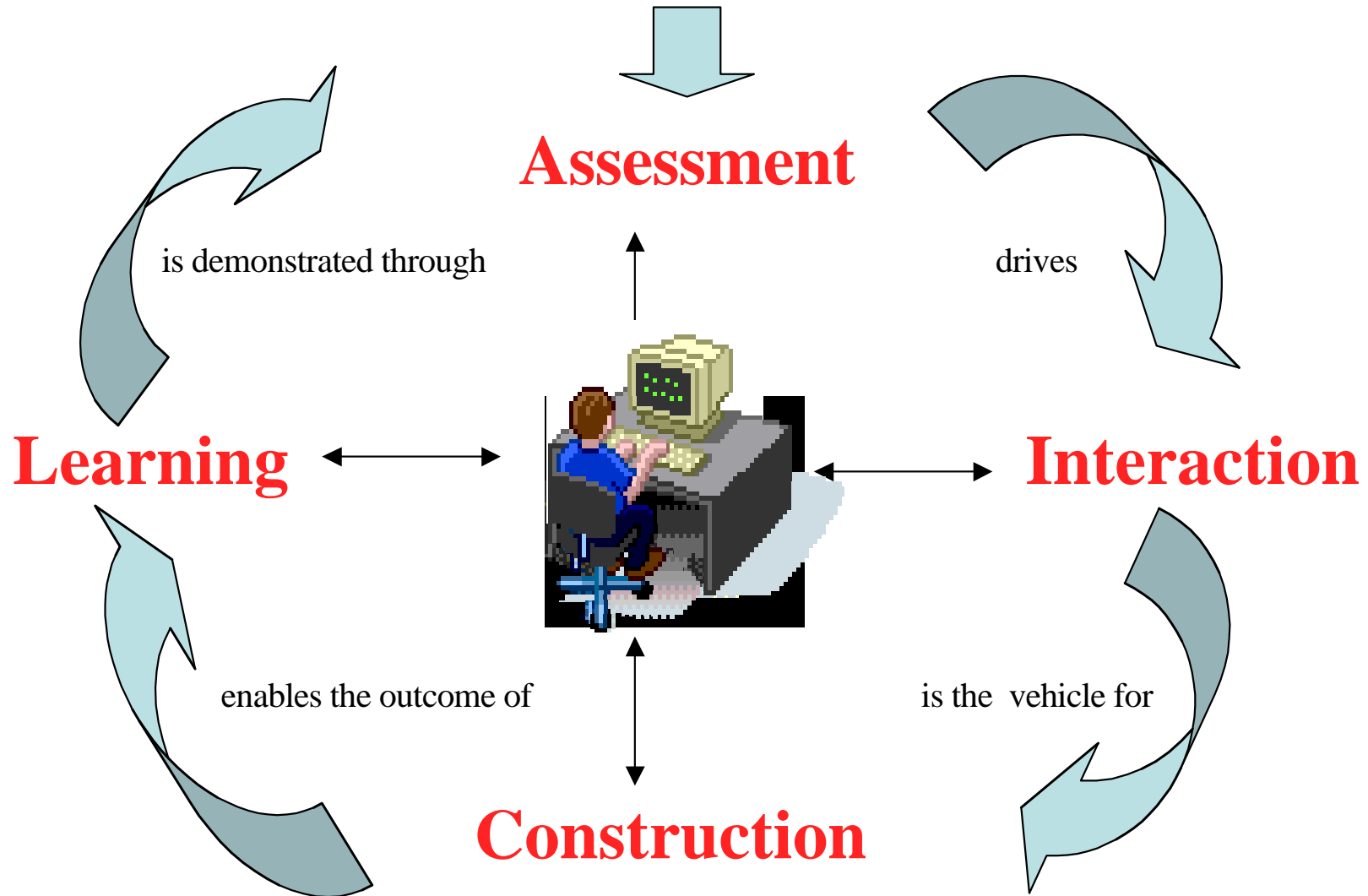
## FAMILIES

- support and encouragement

## LIBRARIES

- information
- electronic services
- databases

# Linking Learning with Assessment



# Learning Management Systems

**ILN** Interactive Learning Network

Announcement  
My Profile  
My Folder  
My Calendar  
Subscribe  
MITE   
ILN FAQs  
Logout

Clipboard  
0 file(s)

Community: 03 -MITE6004

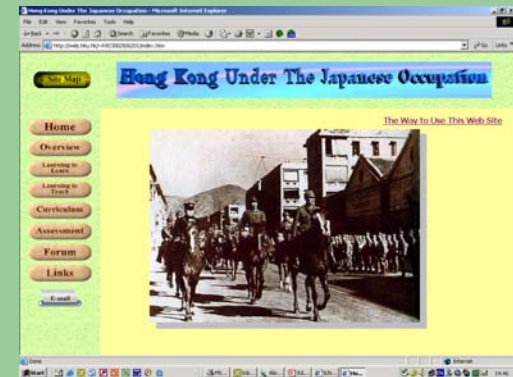
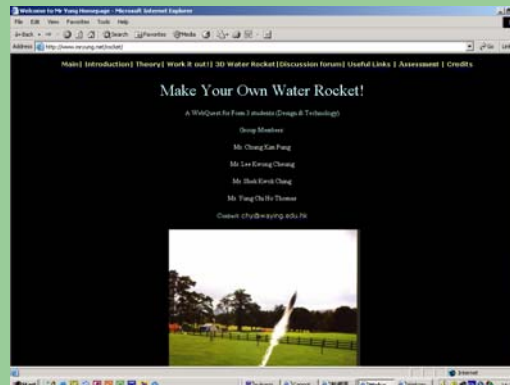
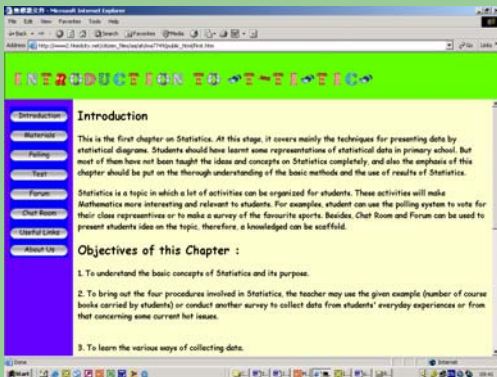
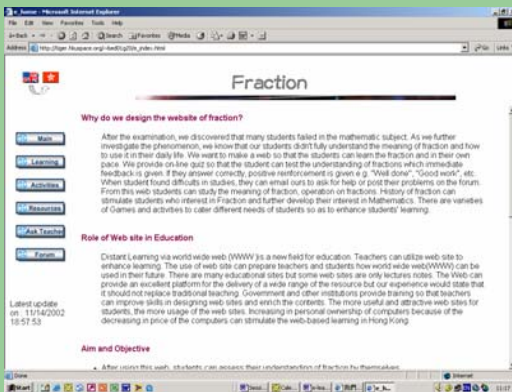
General Information    Participants    Announcement    Resource

Used: 0 KB

- 03JAN-MITE6004
  - 01 Introduction to 6004
  - 02 Practices ICT in Schools
  - 03 Multimedia & Hypermedia
  - 04 CAL Evaluation
  - 05 WWW & Teaching
  - 06 Cognitive Tools 1
  - 07 Cognitive Tools 2
  - 08 Knowledge Building 1
  - 09 Knowledge Building 2
  - 10 Computer Supported Enquiry 1
  - 11 Computer Supported Enquiry 2
  - 12 ICT & Change

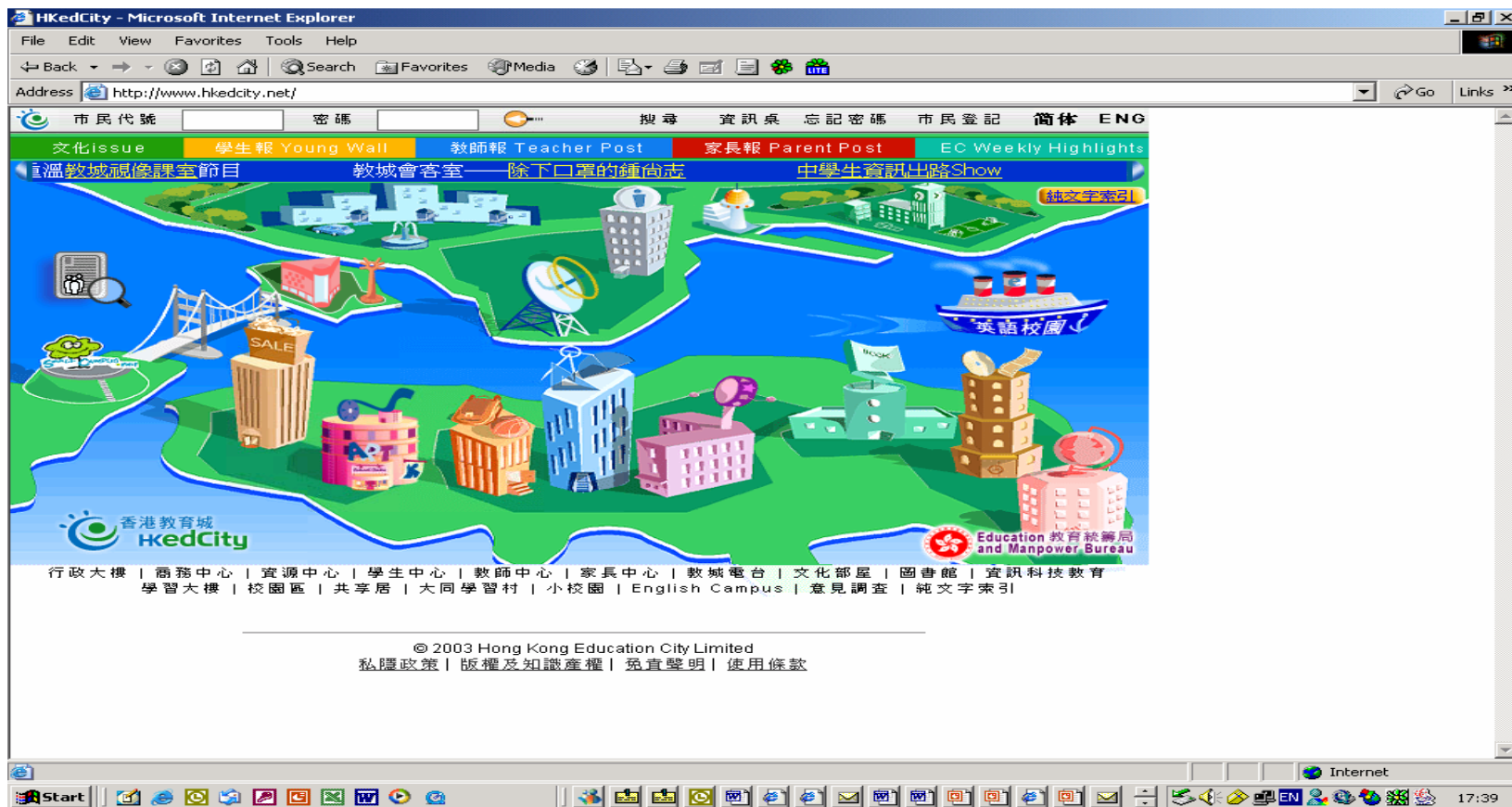
## Teacher built e-learning environments

- **Green Picnic**
- <http://www.rcgs.edu.hk/internet/index.html>
- **Fractions**
- <http://tiger.hkustspace.org/~bed01g20>
- **Statistics**
- [http://www.hkedcity.net/ihouse\\_tools/ihouse.phtml?id=ma7749&pa=ma7749&pa=](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>



# Linking to Resources

<http://www.hkedcity.net/>



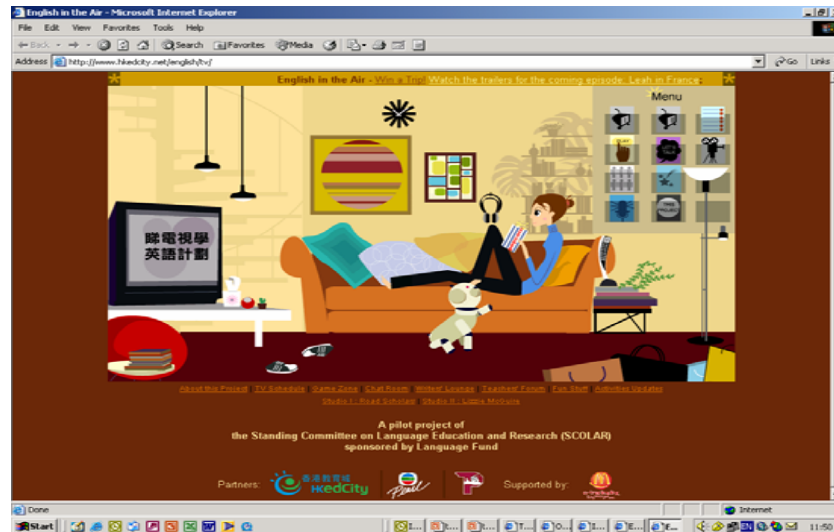


# hkedcity.net

## 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.*



# 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](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](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?*

## Peer Tutoring Project

### The Plan

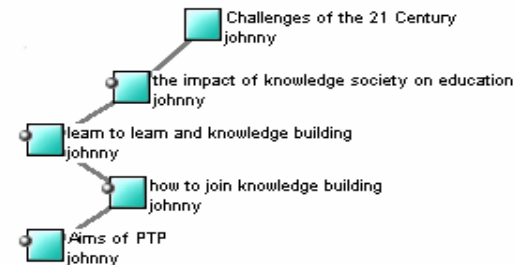
- Welcome
- (PTP) Knowledge building
- (PTP) Awards and winners



課程發展路向



### Objectives

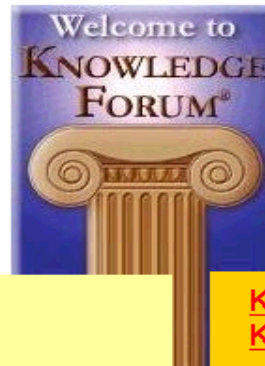


### Schedule



# Knowledge Building and Knowledge Forum

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



A screenshot of the Knowledge Forum software interface with several annotations:

- A Note in KF johnny**: Points to a note titled "My theory: I need to understand new information. This theory says a better theory. Putting our learn".
- The problem under discussion elaine**: Points to the "Problem" field containing "Why my note cannot link up other note?".
- Insert pictures in notes johnny**: Points to a "Welcome to KNOWLEDGE FORUM" image within the note.
- All types of scaffolds elaine**: Points to the "My theory" section.
- Using Scaffolds johnny**: Points to the "Example" section.
- highlight suitable keywords elaine**: Points to the word "BUILD ON" in the text.
- The facts is**: Points to the instruction "You need to press the BUILD ON button at the bottom of this note window in order to respond to other note."

## KF's Function and Collaborative Knowledge Building

### Using Views

- usage of MEWS elaine
  - add MEWS as discussion progress in order elaine
- add pictures and graphics onto views elaine

### Using Rise-above

- use of rise-above notes johnny
  - use rise-above to summarize notes in discussions 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-above note johnny





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

Importance of satellite  
MFS 4D LAU SIU TING

How satellite work?  
MFS 4C Ku Ching Man

The Payload  
MFS 4C Li Cheuk Ying

Satellite Elements  
MFS 4C Lo Wing Yan

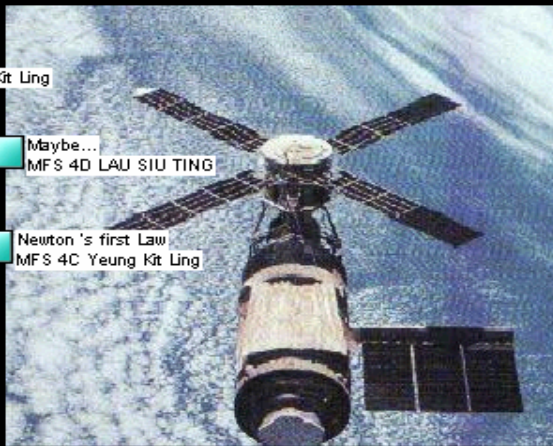
How ?  
MFS 4C Lo Yee Shan

Work!!  
MFS 4C Ku Ching Man

Orbiting Machines  
MFS 4C Lo Wing Yan

Electromagnet  
MFS 4D LAU SIU TING

space transportation system  
MFS 4C Lo Wing Yan



First satellite send by whom?  
MFS 4C Yeung Kit Ling

there are people inside the satellite.  
MFS 4C Yeung Kit Ling

materials to make up a satellite.  
MFS 4C Yeung Kit Ling

satellite and spaceflight.  
MFS 4C Yeung Kit Ling



# 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

**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 → standardized production  
→ produce knowledge workers

# 21<sup>st</sup> 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**

**Australia**

**Canada**

**Chile**

**Denmark**

**Finland**

**France**

**Hong Kong**

**Indonesia**

**Israel**

**Italy**

**Japan**

**Korea**

**Latvia**

**Lithuania**

**Netherlands**

**Norway**

**Philippines**

**Portugal**

**Russia**

**Singapore**

**Slovakia**

**Slovenia**

**South Africa**

**Spain Catalonia**

**Taiwan**

**Thailand**

**UK**

**USA**

# Focus of Analysis

How do we compare innovations?

Practices	Old	New
Technology		
Old		
New		

## 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

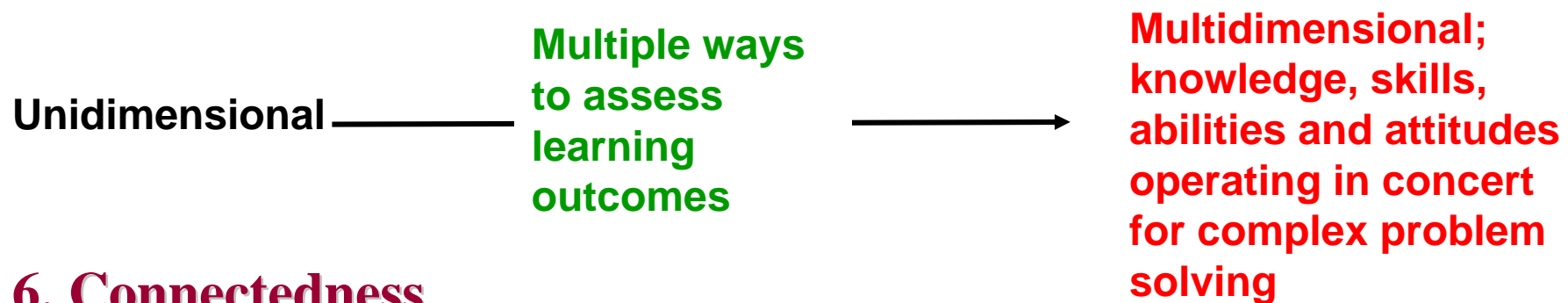
Develop own learning goals, learning strategy, self monitor & evaluate contribute to communal knowledge building

# 6 dimensions to compare innovativeness

## 4. ICT used



## 5. Manifestation of Learning Outcome



## 6. Connectedness







# *Cyber Art Project*



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

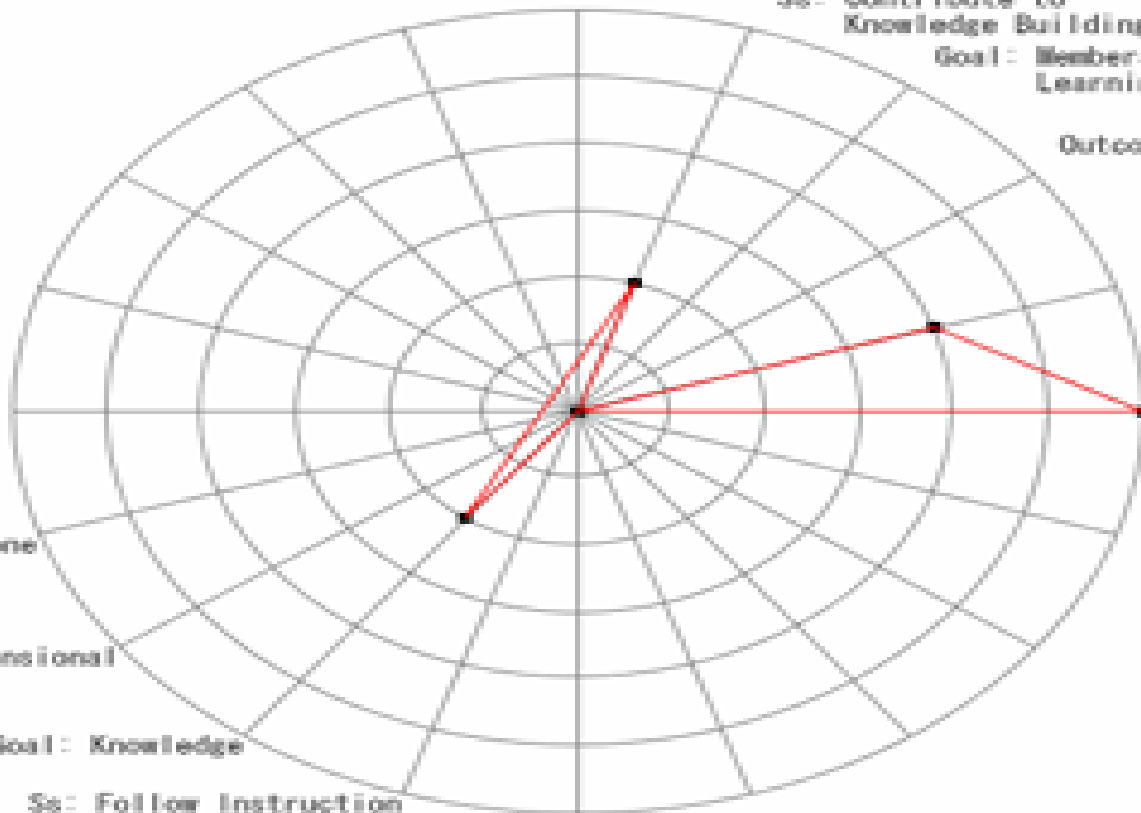
ICT: None

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

# AU001

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

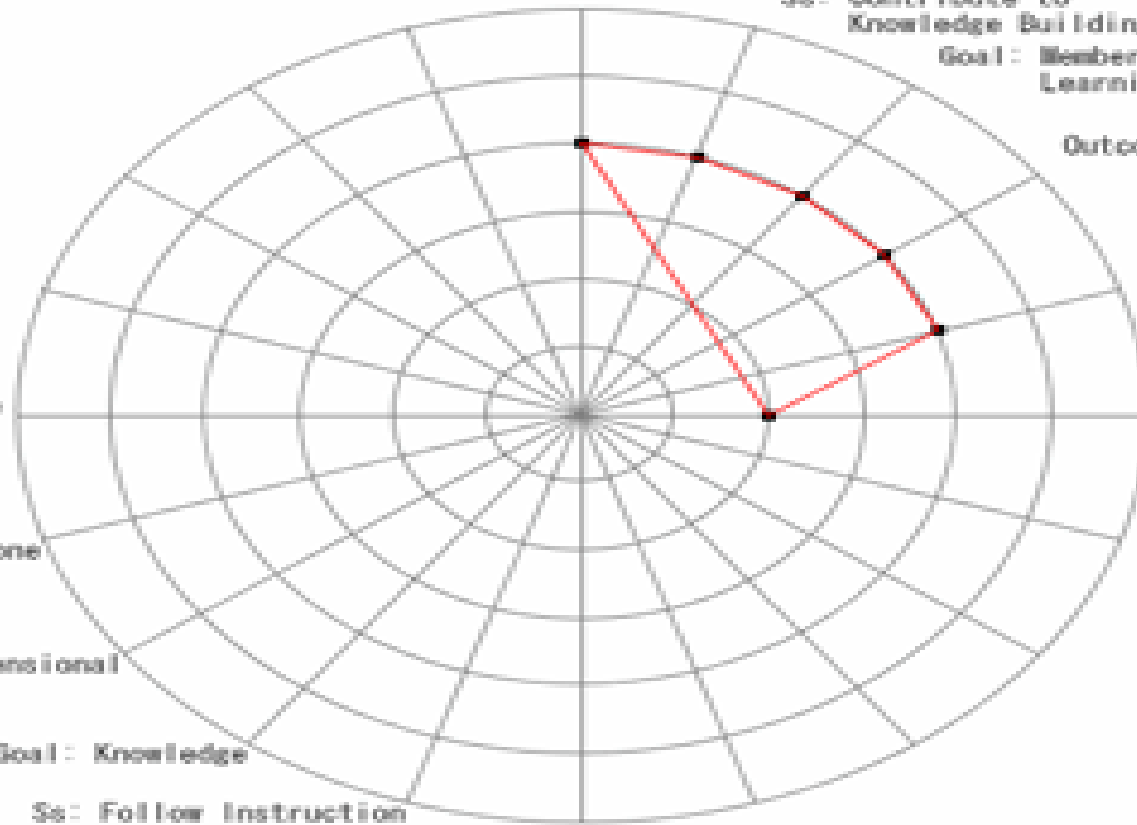
ICT: None

Outcome: Unidimensional

Goal: Knowledge

Ss: Follow Instruction

T: Presenter & Evaluator



# *Educational Radio Station*



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

Standalone

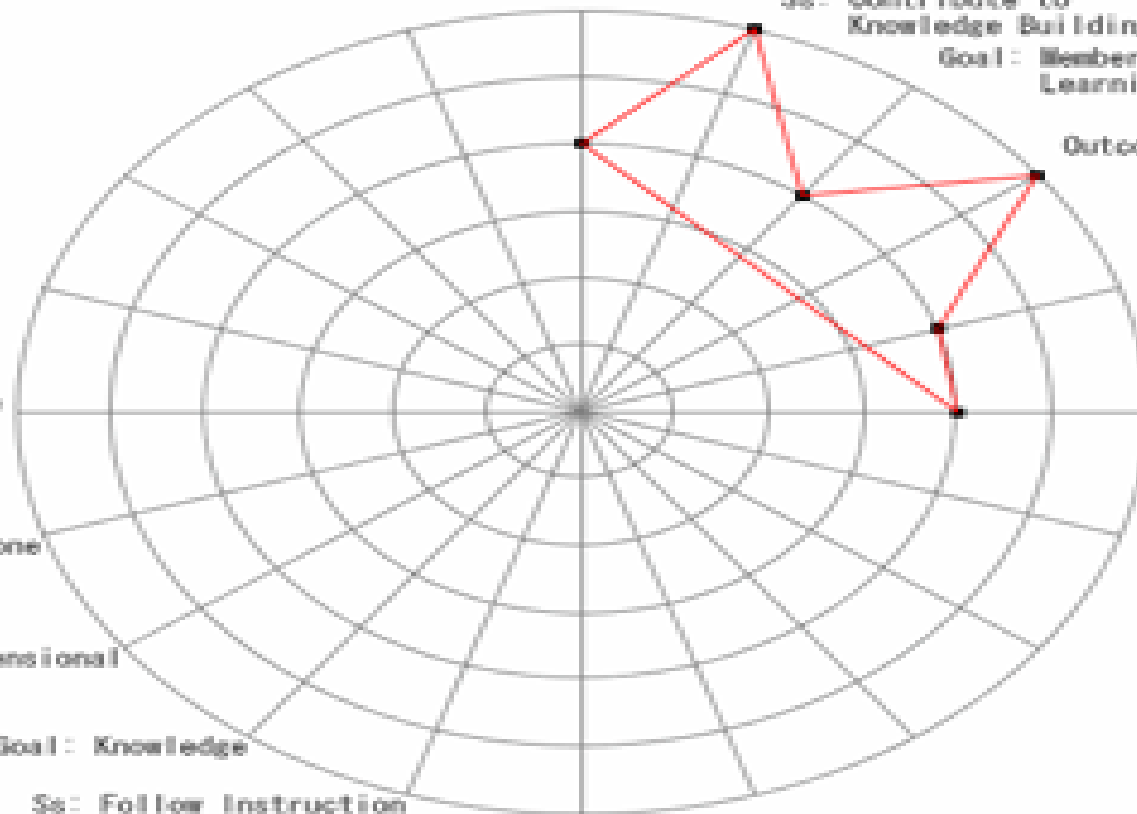
ICT: None

Outcome: Unidimensional

Goal: Knowledge

Ss: Follow Instruction

T: Presenter & Evaluator



# 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 21<sup>st</sup> century.

# *ICT as a Lever for Teacher Change and Development*