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ICT as a Lever for Student Change and Advancement

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Challenges ahead of Us

Shifting Paradigms

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

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

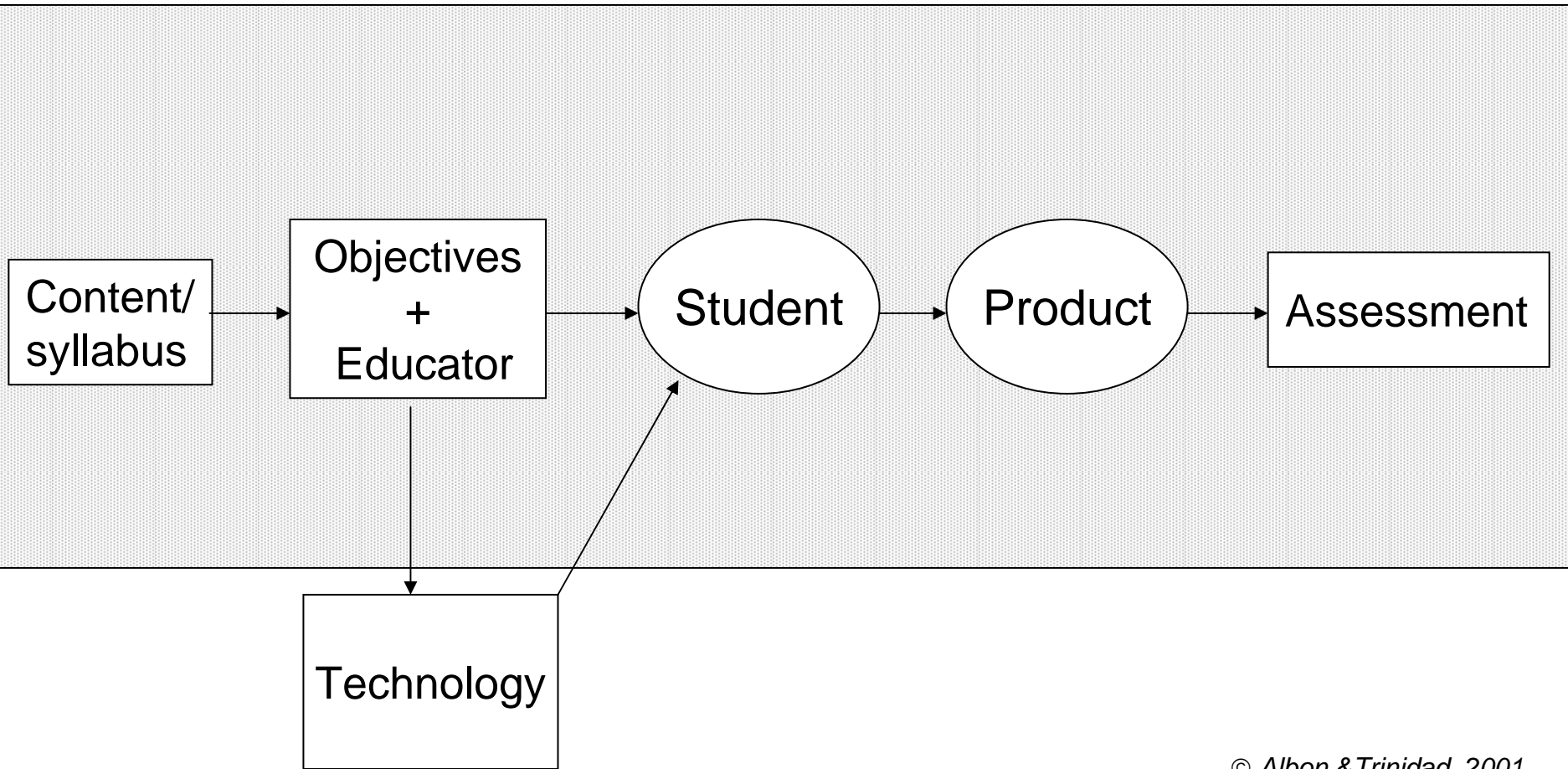**Adequate time**

Immediate feedback

Collaboration

Reflection

The role of the technology

Designing e-learning environments

Teacher-Directed Learning Environment

```
Content/          Objectives          Student    →    Product    →    Assessment
syllabus      →        +          →
                    Educator
                       ↓
                       ↓            ↗
                  Technology
```

School (or school system)

Teacher

Classroom

Parent

Student

Community (home for this group of students)
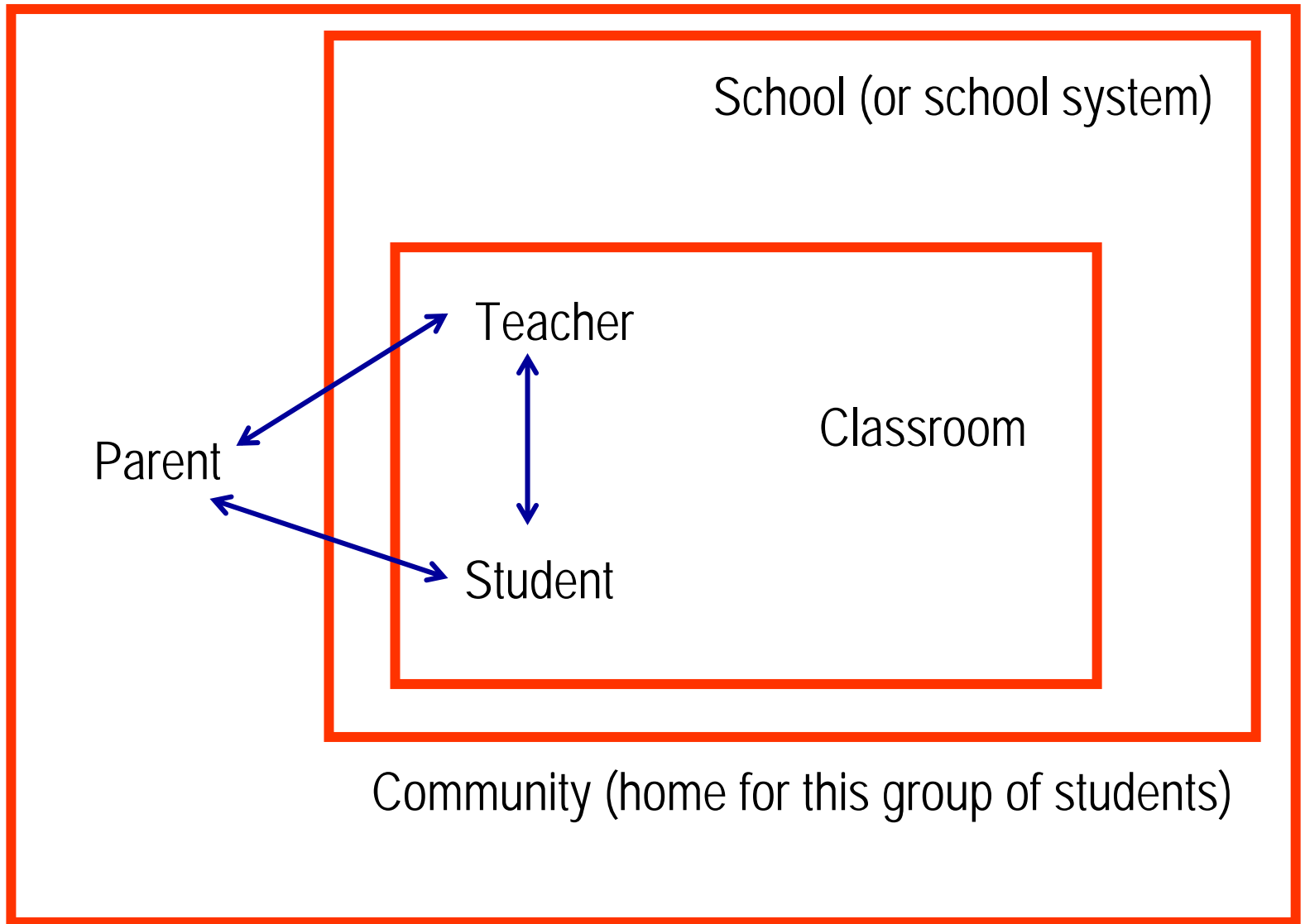
The world at large (beyond the community)

Senge, et al., (2000); p.13

The Learning Community

UNIVERSITY
- Lecturer expertise

PEERS
- variety/degrees of knowledge

SCHOOLS
- Reciprocity schools & university

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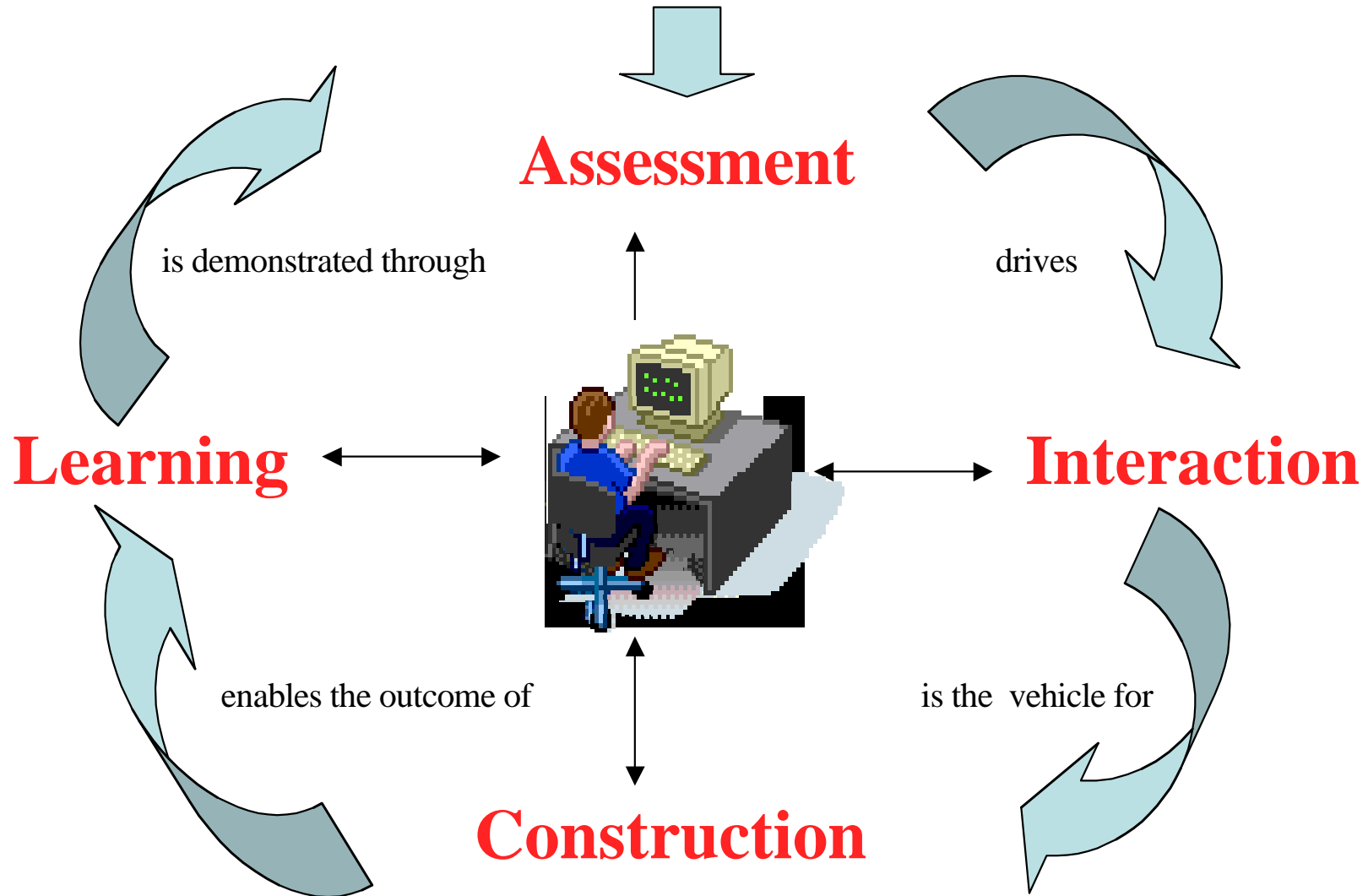- Databases
- Network/organisations

FAMILIES
- support and encouragement

LIBRARIES
- information
- electronic services
- databases

Linking Learning with Assessment

Assessment

is demonstrated through

drives

Learning

Interaction

enables the outcome of

is the vehicle for

Construction

Learning Management Systems

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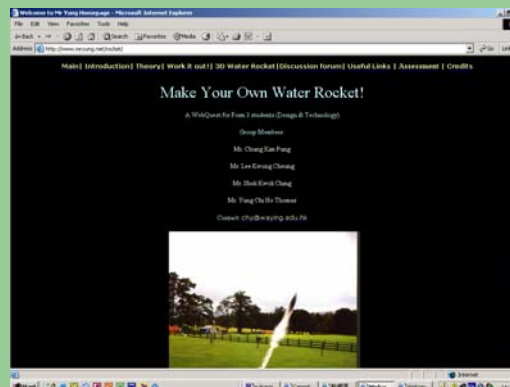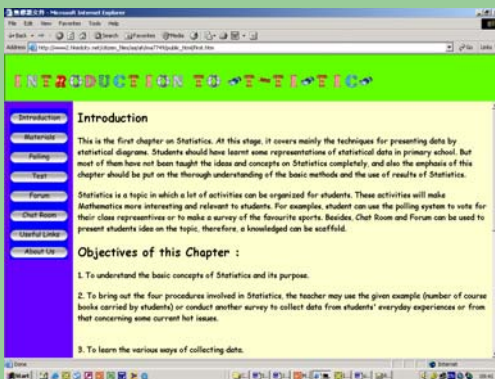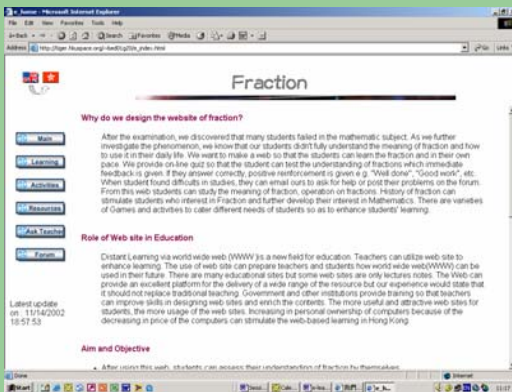
Linking to Resources
http://www.hkedcity.net/
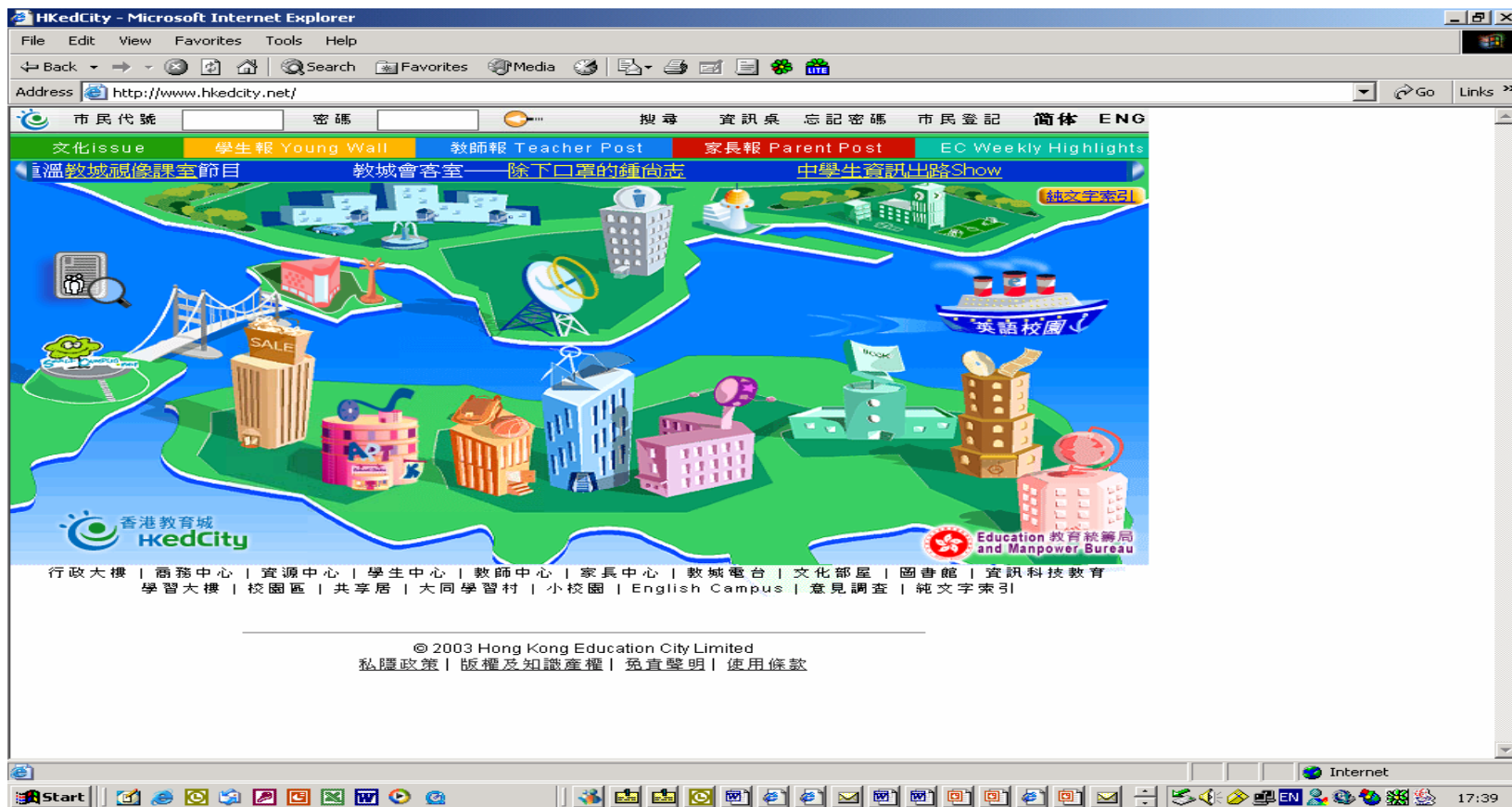
hkedcity.net

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.
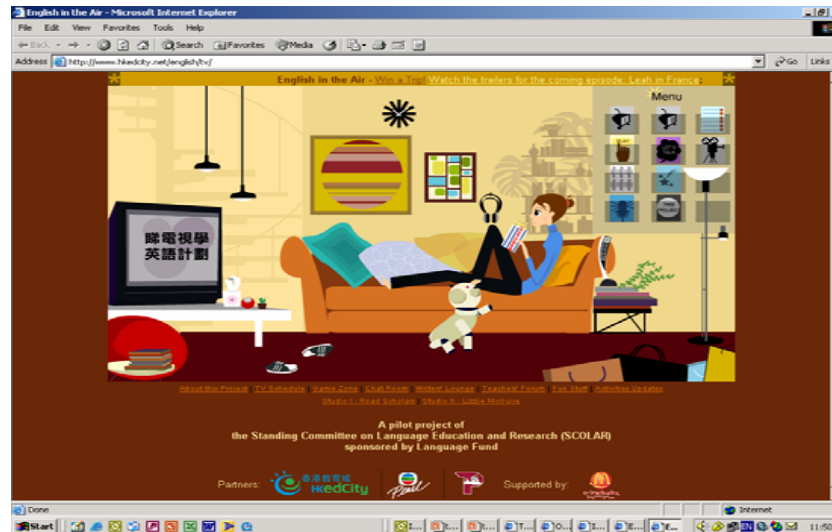
E-learning & SARS

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

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

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

Objectives

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

課 程 發 展 路 向

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

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Centre for Information Technology in School and Teacher Education

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

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

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

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

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

satellite and spaceflight.
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 Elments
MFS 4C Lo Wing Yan
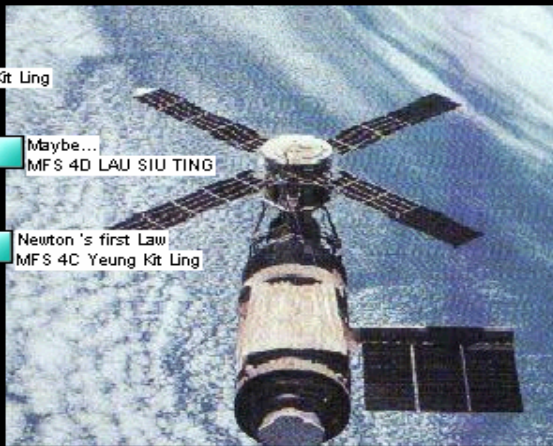
How ?
MFS 4C Lo Yee Shan

Work!!
MFS 4C Ku Ching Man

Orbiting Machines
MFS 4C Lo Wing Yan

Electromegnet
MFS 4D LAU SIU TING

space transportation system
MFS 4C Lo Wing Yan

Scaffolds | Keywords | Problem | i | Notes and Views

Start | http://webmail... | (MFS) Group ... | presentations | Microsoft Powe... | EN | 7:05

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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 **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

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

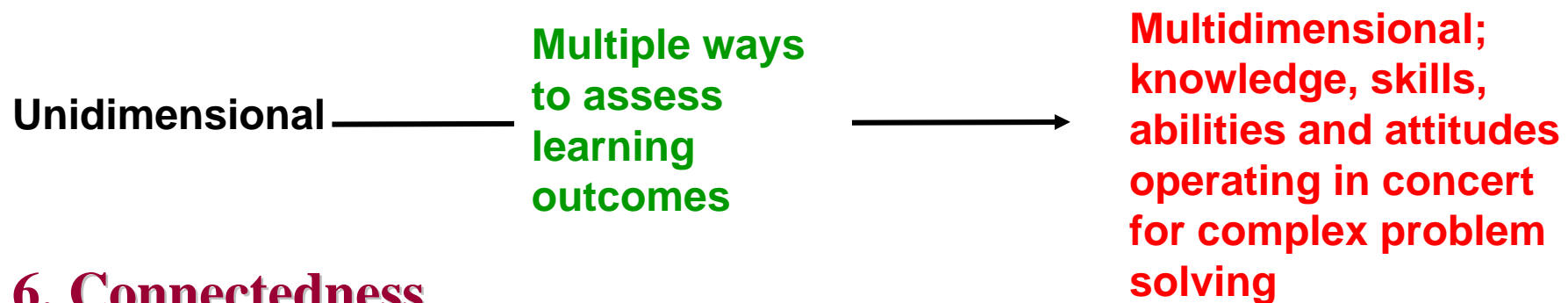**Follow instructions** ———————— **Determine learning strategies and schedule** ⟶ **Develop own learning goals, learning strategy, self monitor & evaluate contribute to communal knowledge building**

6 dimensions to compare innovativeness

4. ICT used

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**

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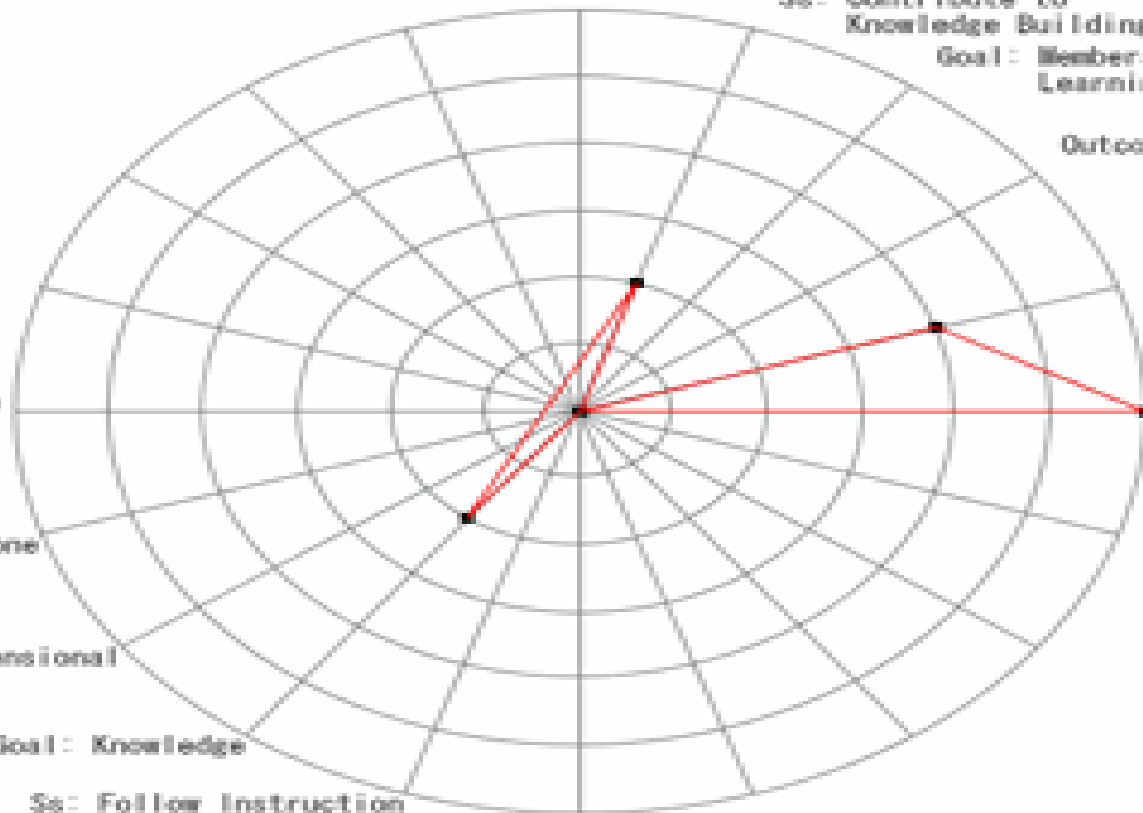Broad Community
Standalone
ICT: None
Outcome: Unidimensional
Goal: Knowledge
Ss: Follow Instruction
T: Presenter & Evaluator

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
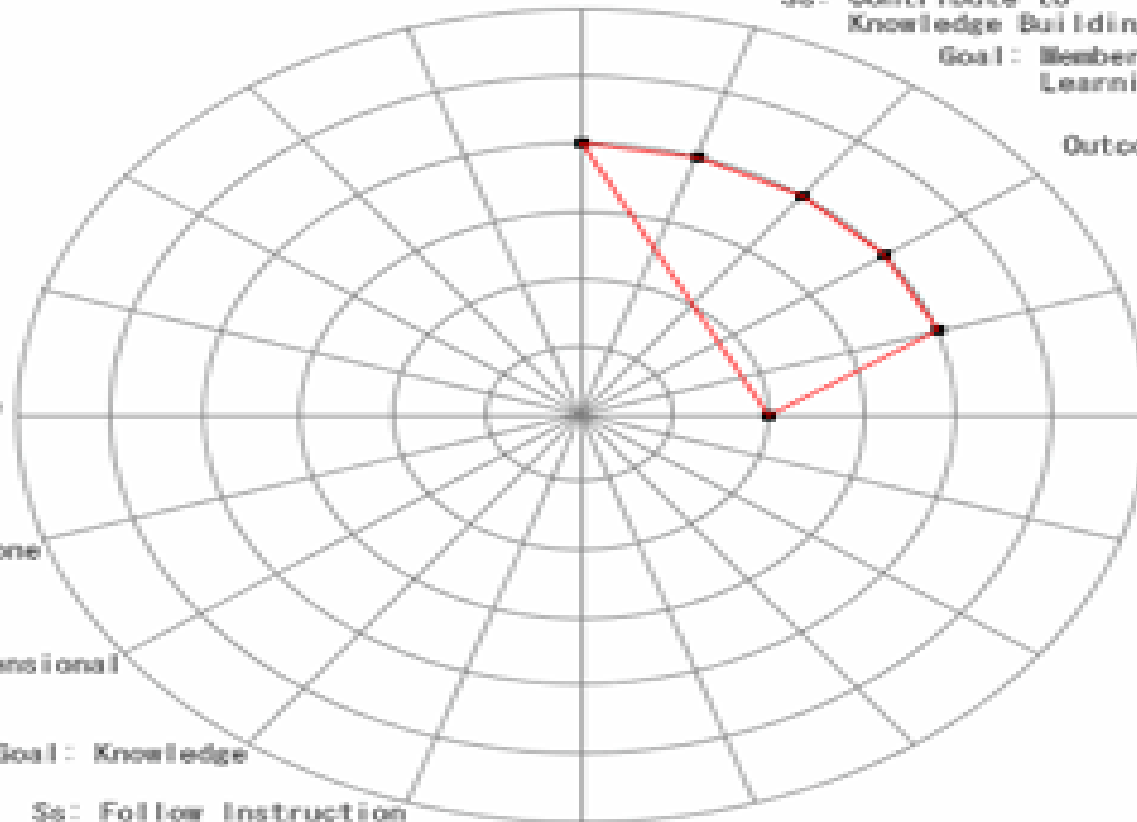
ICT: Specific/Sophisticated
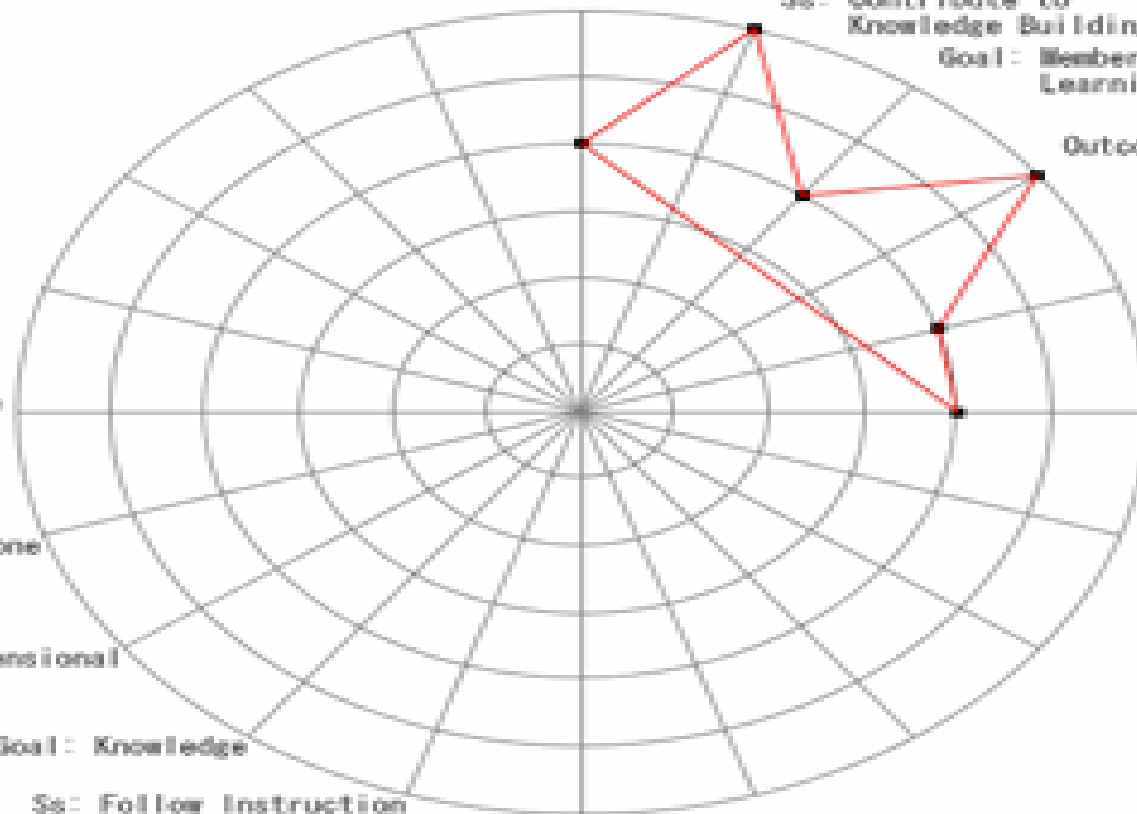
Broad Community

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 21st century.

ICT as a Lever for Teacher Change and Development