Preparing for teaching in an information society: various perspectives

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Part 1:

- *Curriculum perspective: what should be learnt and taught?*

- *Change perspective: what can be done to realize desired changes?*

Part 2: international perspective

- *Some findings from international (comparative) research*

- *Exploratory study in the Netherlands*

Curriculum perspective

Knowledge economy – Information society:

Knowledge no longer primarily knowing facts and theories and being able to reproduce them

('old' knowledge – reproductive skills)

BUT:

ability to find relevant data and to derive meaning from it (lifelong learning skills)

('new' knowledge – productive skills)

Lifelong learning skills:

In new circumstances, being able

- to generate and evaluate answers to open, non-standardized questions,

- to set own learning goals,

- to plan and regulate own learning

- to evaluate own progress

Need for

analytical, creative and synthesizing skills

Implications for education:

- Other balance needed between 'old' and 'new'

- enable learners to become more active and make them more responsible for arranging their own learning process

- teachers becoming more 'professional coaches'

Emerging pedagogical practices for information society
(Voogt & Pelgrum, 2003)

1. New goals: students become competent in information management, communication, and collaboration, and metacognition.

2. Less structured sources of information as learning materials.

3. Traditional boundaries between subjects to be bridged

Emerging pedagogical practices for information society (contd)

4. Gap between discipline-related knowledge taught in schools and application of knowledge in real life to be bridged

5. Boundaries between the school and outside world need to fade.

=> More focus on needs of individual learners

=> Other ways of assessment: more open, more formative

Obvious role of ICT in realizing new vision on teaching and learning:

- as a *general tool* (e.g. word processing),

- as *digital learning resources* (e.g. tutorials, simulations, web-based materials, digital encyclopedia, etc),

- as *network and communication tools* (e.g. internet browser, email software),

-as *digital tools* (e.g. microcomputer based laboratories, statistical tools, accounting-bookkeeping software)

No neglect of 'old' knowledge':
what has traditionally been valued as
important knowledge and skills

BUT

schools should reflect *a good balance between what is traditionally valued and what is considered important in the information society.*

Some findings from international studies

- SITES: Second International Technology in Education Study

- Under auspices of IEA

- Module 1: survey of schools in 26 countries
  - To what extent innovative pedag practices relevant for the information society

- Module 2: 174 qualitative studies (28 countries) of innovative pedagogical practices using ICT

From SITES-M1: changes in pedagogy

11 questions to Principals about type of pedagogical practices in their schools – factor analysis:

Factor 1: Emerging practices (M2: LLL) *:*

- Students active and responsible for own learning

- Cooperative/project-based learning

- Searching for information

- Working at own pace

From SITES-M1: changes in pedagogy

Factor 2: Traditional practices:

- Emphasis on development of skills

- All students working on same materials

- All students working at same pace

- Teachers keeping track of all student activities and progress

From SITES-M1: changes in pedagogy

Both practices in most schools!

But large differences among countries.

E.g. for lower 2nd education:

- NOR, DEN and HUN high and HKG and JPN lowest on factor 'emerging practices'

- In 21 (out of 24) countries: median values for 'traditionally important practices' higher than on 'emerging practices' – exceptions: DEN, HUN, NOR, and SLV

Some findings from *SITES-Module 2:*

- cross national impression of how schools are looking for a new balance between a traditional pedagogy and an emerging pedagogy for the information society,

and also

- how ICT is supporting pedagogy.

From SITES-M2: patterns of innovative ICT use in classrooms

Few trends across innovative cases (n = 174):

Teacher practice:

- advising students: 90%
- creating structure for studs' activities: 80%
- lecturing regularly: only 25%
- giving students drill & practice: only 13%

From SITES-M2: patterns of innovative ICT use in classrooms

Student practices:

- collaborating with other students: 83%
- searching for information: 74%,
- designing or creating products: 61%
- publishing or presenting results of their work: 66%
- solving problems: 33%
- analyzing data: 22%

From SITES-M2: patterns of innovative ICT use in classrooms

ICT use by students:

- E-mail: 68%

- productivity tools: 78%

- ICT supported search for information: 77%

- use of Web resources: 55%

- collaborative environment: 9%

- simulations/research: 13%

SITES-M2: patterns of ICT use
(based on cluster analysis; n = 147)

Tool Use	Various technologies and ways of ICT use (no distinctive patterns)
Student Colla-borative Research	Students work in pairs/groups – doing research (86%) and/or collecting/analyzing data (36%)
Information management	Tchr & stud activities involving searching, managing, processing, using info for T/L

SITES-M2: patterns of ICT use
(based on cluster analysis; n = 147)

Teacher colla-boration	Tchrs collab with studs (100%) and colleagues (96%)
Outside commu-nication	Studs work outside classrm; ICT for commun & production
Product creation	Design of digit. products; use of packages for design of prod
Tutorial	To support instruction; allows for indep work and feedback

SITES-M2: patterns of ICT use
(based on cluster analysis; n = 147)

Considerable overlap between patterns:

- All cases in Teacher Collaboration and Information Management have Product Creation

- All cases in Student Collab Research and Information Management have Tool Use.

SITES-M2: Factors influencing ICT sustainability of supported innovtns
(Owston, 2003)

-59 (out of 174) cases provided evidence of being sustained and transferred

From analysis and based on literature:

Model for sustainable implementation with two sets of contributing factors:

- *essential factors*
- *contributing factors*

SITES-M2: Factors influencing ICT sustainability of supported innovtns

Essential factors:

- *Teacher support* (!)

- *Student support:* motivating for teachers

- *Perceived value:* increased stud knowledge & skills contributes to perception of value

- *Teacher professional development* – non traditional forms, e.g. peer study groups

- *Administrator support*

SITES-M2: Factors influencing ICT sustainability of supported innovtns

Contributing factors:

- Support from others (peers, parents, external officials)

- Innovation champions

- Funding

- Supportive policies and plans

  espec. national/state ICT plans

Teachers are key actors:

New competencies needed, e.g.:

- management of information, groups and time

- technical ICT skills

- pedagogical skills to work with ICT in student-centred pedagogy

Redesigning of teaching profession needed!
 (Dillemans et al., 1998)

Personal entrepreneurship of teachers (PET)

2nd analysis of ICT monitor (survey) among Dutch primary teacher educators (Drent, 2005):

What factors influenced innovative use of ICT by teacher educators?

Exploratory study

PET: dependent variable

innovative use of ICT:

Scale of 5 items (Cronbach's α = .61):

-     Information gathering

-     Data processing

-     Presenting

-     Introducing of new subject

-     Problem solving

Represents 'growth' in use of ICT!

Factors influencing innovative use of ICT

from PLS analysis:

1. Student oriented pedagogy
2. Positive attitude towards ICT
3. Years of computer experience
4. ***Personal entrepreneurship***

- #3 and #4 strongest influence
- ICT knowledge/skills no direct influence, but via other factors

Personal entrepreneurship of teachers

Based on two manifest variables:

- *communication/interaction:* degree of having contacts with colleagues (inside/outside) about use of ICT

- *utilizing professional network:* # of organizations/persons from which teacher educator gets support in using ICT

"amount of contacts (inside/outside) initiated by t.educator for own professional development in pedagogical use of ICT"

Personal entrepreneurship of teachers

 - *direct* influence on 'innovative use of ICT'

Also *indirect* influence, as PET has direct influence on other important factors:

- ICT attitude
- Pedagogical approach
- ICT competence

Metaphor of a system of seizing cogwheels:

if one cogwheel moves, the others will also start moving!

Personal entrepreneurship of teachers

NOTE: PET is *directly influenced by* internal support structure:

- support from management,
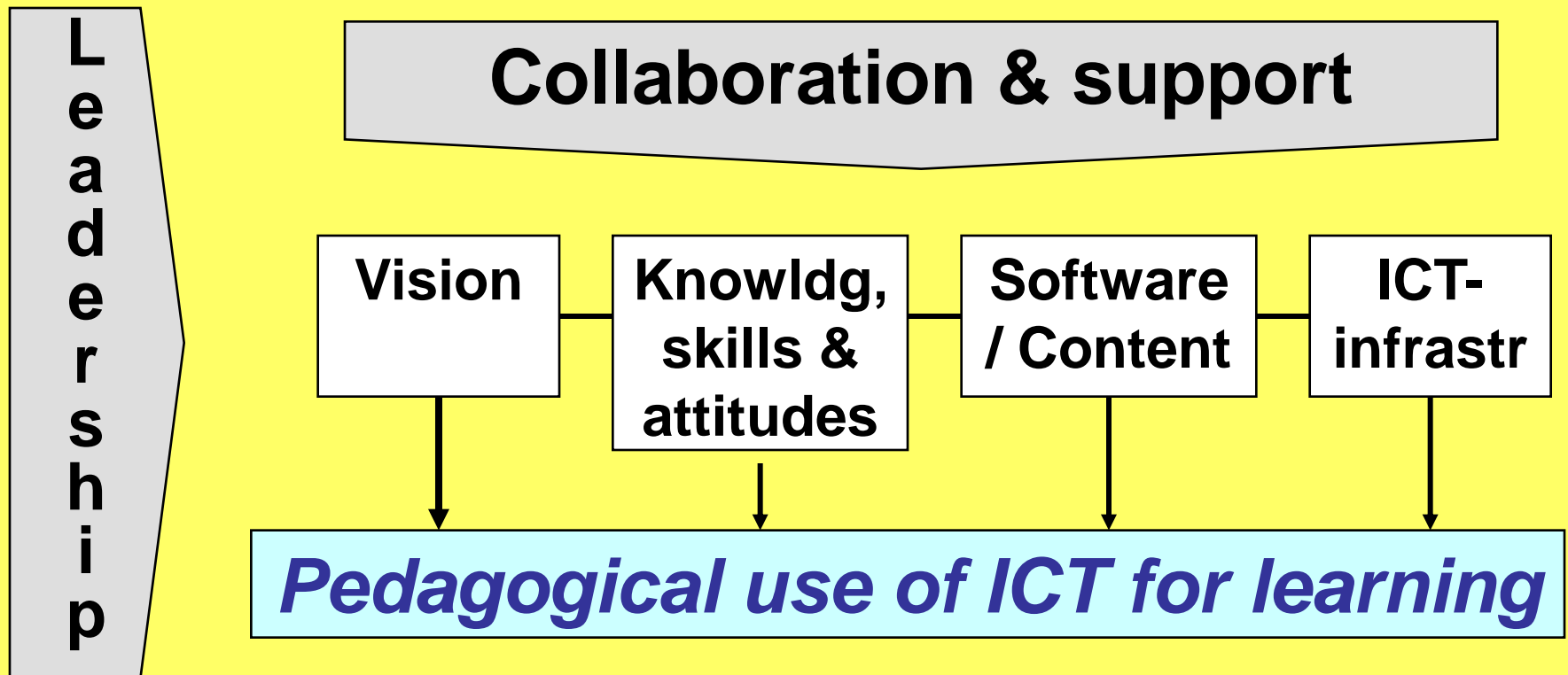
- availability of pedag and technical support

So:

the school's support and the school's stimulation of personal entrepreneurship can make an important contribution to the realisation of innovative use of ICT.

Profile of teacher educator
who uses ICT in innovative way:

1. Capable of keeping contacts with colleagues and experts on ICT for sake of own professional development

2. Sees and experiences advantages of innovative use of ICT in own teaching

3. Has a student-oriented pedagogical approach

4. Has ICT competence complying with #3

Model for introducing pedagogical use of ICT in schools (ICTOS, in press)

Thank you!

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