

ICT and changes of higher education

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Personal background

- Professor of education at Göteborg University, Sweden
- Adjunct professor of information science at University of Bergen, Norway

Personal background

- Research and teaching
- Advisor to the vice-chancellor on ICT: ICT-policy, infrastructure, administrative support systems, staff development, and ICT for learning
- Board-member of the Swedish National Agency for Distance Education, SUNET and Ladok.

Outline of the presentation

- Some general trends in changes in society, related to the question of ICT and higher education.
- General demands on and changes of higher education.

Outline of the presentation

- ICT-related changes in higher education.
- National initiatives
- “State of the art” with regard to
 - Pedagogy
 - ICT and learning
- (Some) conditions for extended use of ICT in higher education

Patterns of change in society

- Globalisation
- The new economy
- Diversity and multi-culturality
- Trans-national operations
- Shorter time-cycles / just-in-time

Important patterns of change in society with regard to ICT

- Expansion of high-quality ICT-infrastructure
- Increased functionality of ICT-tools
- Commercialisation of ICT
- Merging of mass-media and ICT
- Increased use of ICT in everyday life and at work

Expansion of high-quality ICT- infrastructure

- Access to computers at home (2000)

Age	%
9-14	83%
15-19	80%
20-24	63%
25-34	78%
35-44	81%
45-54	77%
55-64	51%
65-79	23%
Tot	64%

Expansion of high-quality ICT- infrastructure

- Access to computers anywhere
 - 94% of students 15-24 (1998)
 - A digital divide: workers, retired, unemployed.

Expansion of high-quality ICT- infrastructure

- Access to Internet at home
 - 50% of the population (1998)
 - 78% in the agegroup 15-24 (1998)

Increased functionality of ICT- tools

- More powerful hardware
- Improved interfaces / userfrienliness
- More powerful tool for production

Commercialisation of ICT

- Information-services
- Communication-services
- Games
- Edutainment
- Multi-media

Merging of mass-media and ICT

- New standards for communication and presentation
- Changing ontologies and epistemologies
 - what is (important) knowledge
 - how do you gain this knowledge

Increased use of ICT tools in everyday life and at work

- Computer use at home on a single day (1999):
 - 39% (15–19)
 - 26% (20–24)
 - 33% (25–34)
- Average using time: 1 hr. (1999)
- Use of Internet (home, school, work) (1999)
 - 31% of total pop on a single day.
 - 45% (15-24)

General patterns of change in higher education

- Globalisation
 - New and more actors
 - Networks and co-operation
 - Virtual organisations
 - International competition

General patterns of change in higher education

- New modes of operation both for R&D and for education/teaching
 - Projects
 - Cross-disciplinarity
 - Diversity of educational courses and programs
- De-centralisation of organisation

General patterns of change of change in higher education

- Massification/Accessibility
- Demand for (pedagogical) quality
- Demand for cost-effectiveness
- Demand for responsiveness
- The notion of life-long learning
- A demand to use ICT

General patterns of change

- Pedagogy – the emergence of a new paradigm?
- Use of ICT and pedagogy

Pedagogy – the emergence of a new paradigm

- From teaching to learning
- Open and flexible learning
- Distance-learning
- Problem-based learning
- Practice-based education
- Changing roles for the teacher

Pedagogy – the emergence of a new paradigm

- Focus on
 - the individual student
 - the individual in the context of the group
 - resources for learning – not teaching learning materials
 - complementary media technologies / ICT

Pedagogy – the emergence of a new paradigm

- Focus on
 - Learning as knowledge construction in specific subject-matter areas
 - General problem solving skills
 - Communication
 - Collaboration
 - Processes of learning, not only products

ICT in higher education

- as a goal – content
- as a mean – a tool for work and learning
- as a battering ram – promotion of structural and organizational change/transformation

Swedish initiatives

- Large programs to promote usage of ICT in universities and schools
 - Council for the Renewal of Undergraduate Education
 - National Agency for Distance Education
 - KK-foundation
 - Wallenberg-foundation
- However, a major part of the financial burden is carried by local universities – as part of their mission

Focus of initiatives

- Improving quality of
 - ICT-infrastructure and services
 - ICT-competence
 - Pedagogical tools and usage
 - Technologies
- Organizational restructuring
 - Collaboration universities-schools-companies
 - Networking – virtual constructions

Visions and realities

- In general
 - Use of ICT in higher education is widespread
 - However, the "pedagogical usage" is not very developed

Usages

- Writing, writing, writing, writing!
- Electronic publishing, sometimes
- Email / Communication
- Information searching on the Internet
- Collaboration

Usages

- Modelling and simulation
- Multimedia
- CBT
- “Electronic books”

Usages

- Many isolated projects
- Not built into an institution

Conditions for technology use

- Infrastructure and services
- Competence
- Professional tools, content, culture and mindset
- Pedagogical ideas and approaches
- Financing

Infrastructure and services

- High quality highways (SUNET)
- Mixed quality of local university networks
- Workplaces never enough for students
- Teachers
 - Access to computers/networking at the workplace
 - Access at home through private initiatives and special programs
 - The digital divide!!
- Students
 - Access to computers/networking at school
 - The digital divide!!

ICT in higher education – infrastructure and services

- Support
 - Access to technical support is a crucial factor, generally noted by teachers and students.
 - Support for utilizing the pedagogical potential of the computer is sought for
 - In most universities there are some initiatives to support teacher in using ICT for pedagogical purposes in the classroom and for production of material

ICT in higher education – competence development

- Most teachers and students have basic knowledge and skills of using the computer as a *personal tool*, but are not proficient
- Subject-matter related competence is more developed
- Competence in using ICT for pedagogical purposes is not very high
- But habits of using ICT on an everyday basis are more and more common

Professional tools, content, culture and mindset

- Attitudes towards “new” technology (Becker, RRV)
- Use of ITC as a professional tool (Runesson & Lindström)
- Work routines (Ekeblad et. al.)

Pedagogical ideas and approaches

- Teaching/learning models
 - Pedagogical philosophy and amount and type of use co-vary (Becker; Juhlin Svensson)
 - Examination forms/institutionalised demands is crucial for how students work (Bergqvist & Lindström; Lindström, Marton, Lurillard et. al.)

Financing

- Costs for production of ICT-based material, support and re-investment in infrastructure are problematic.

Important notes

- Empirical observations of the introduction of computers in education tell us that, so far, the changes of basic pedagogical forms are not very revolutionary.
- The didactical use of ICT is of minor importance, despite the e-learning movement.
- ICT is much more a tool for personal productivity.
- A trend that pedagogical development is driven by use of ICT as a subject-matter tool.

Important notes

- The administrative use of ICT for handling information is basic.
- More important are general usage (habits) of ICT and societal “ICT-literacy”.
- Access to a developed infrastructure is necessary, but not sufficient.
- The single most important factor is the examination procedures used.
- Technology push pedagogy to a very little extent. The major finding is that new technology is used to “re-dress” old pedagogies.

Important notes

- Tools for flexible learning must be customisable.
- New ICT-based tool for production of “text” (multimedia), information search and handling, and communication will probably make a difference in the longer run.
- Higher education is very much a matter of socializing people into certain modes of thinking and acting, which makes it difficult to base it more exclusively on ICT.

Important notes

- Teacher roles will become more crucial.
- Costs is a major issue.
- The digital divide is a real problem!

Finally

- Universities are cultural institutions
 - They will change slowly,
 - but perhaps faster than we believe today