Experience Bases, Learning and Continuing Education in the Virtual Company

Reidar Conradi
NTNU, Trondheim, Norway
conradi@idi.ntnu.no

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Overview

1. Context: the IT Society
2. Perspectives on continuing education
3. Open and possibly virtual university
4. Learning Organizations, Experience bases
5. Didactics for the electronic university
6. Examples of remote teaching
1. Context: The IT Society

- **Some examples:**
  Ex. In 1995-97 in USA, 25% of growth was IT-related (PITAC-report).
  Ex. Aug. 98 in USA, email has more msg.s than phone and postal mail.
  Ex. Per 2000, 350 mill. people connected to the Internet.
    In 2004: 3 bill. mobile phones, 1/10 with powerful computers (IDC).
  Ex. In 2010?: 65 Gbits (8000 books) on single chip (Moore's law).
- **IT industry** now the largest in the USA, 15% of BNP.
- **Software industry:** 13% annual growth (Economist, 25-31 May 1996).
- 2-3% **software/system developers** (50,000) in Norway:
  most without a formal IT-education.
  Need to double in 4 years! – unrealistic(??).
- **5-10% of job on continuing education/(re)training**
  -- A source of major public initiatives and labor/employer negotiations.
- **EU’s IRDAC report:** continuing education bigger than basic education
  (years 6-18), or 5-6% of BNP in year 2000.

2. Perspectives on continuing education

- **Human capital:** *the knowledge and skills of your employees.*
- **Lifelong learning** -- big potential, never finally "educated":
  I.e., first a broad basic competence, later special competences.
- **Need a knowledge platform** in order to:
  -- Learn continuously (specialization, job skills), plus social
    infrastructure for learning.
- **Change is constant and pervasive;**
  Organizations that can adapt to changes, will survive.
  Ex. Most goods/services to be produced 4-5 years from now are
  unknown, maybe the companies also?
- **All levels of continuous/post education:**
  specialists, multi-disciplinary, basic support.
3. Open and possibly virtual university

- **Diversity of such education:**
  - On-job training, part-time job/study, spare time.
  - Short local courses, short external seminars etc.

- **Corporate "universities", part of above:**
  - May define their new/own curriculum and courses.

- **Campus vs. remote education:** Both, but may be more equal.

- **Some examples:**
  - The Norwegian Network University: remote education across sites.
  - The Norwegian Corporate University: courses against companies.
  - Open University i England, since late 60s.
  - Fernuniversität Hagen in Germany, since 70s.
  - Completely new university in Phoenix, USA -- no campus.
  - The "virtual" world university: follow from campus, job, home.

- **Given 3% (?) system developers in industrial societies:**
  - 5% informalized education: same as # normal students!

- **Private courses (too) costly:** 500 Euro for one-day course in web or Java!

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4. Learning Organizations, Experience bases

- **Computers + telecom gives cheap data distribution:**
  - Exploit Internet, e-mail, groupware, ...
  - --> **Web technologies**, but how to maintain the contents and manage the general information overload – via portals?

- **Experience Factory** approach for software engineering (NASA-SEL, Basili and Rombach): can it be coupled to education?

- **But a dilemma:**
  - **Externalization (easy):** 1. Try to collect experiences (data), 2. Refine these into models and combine these into recommendations of best practices (passive **information**).
  - **Internalization (hard):** 3. Disseminate, 4. Inject improved models into new, socialized work practices (operational and active **knowledge**).

- Risk of having an **information dump / graveyard**.

- Must **demonstrate concrete usefulness on a daily basis**.
  - Also solicit comments and feedbacks, i.e. **two-way communication** ("CSCW style"), not only one-way flow -- **revolutionary learning!**
5. Didactics for the electronic university

- Didactics for professionals -- quality and relevance:
  I.e. project/problem-oriented, both group/individual-based
  Ex. Software engineering:
  -- Practitioners understand the problem, want concrete solutions.
  -- Students does not understand the problem, solutions without context.
- Spectrum of possibilities:
  -- Read textbook, plus local projects and own teacher.
  -- Remote education, partly over Internet and partly by video.
  -- Both full-time, part-time, and spare time.
  -- Combine courses from different sources (with credits).
- More research needed:
  -- Adult pedagogics: premises for different kinds of learning?
  -- Combine teaching with on-line experience bases?
  -- Computer-assisted education: how, what software?

6. Examples of remote teaching

- Norwegian examples:
  -- Ex. Lillehammer College (north of Oslo):
    number of remote and campus students the same, totally 4000.
  -- Ex. Gjøvik College:
    “broadcast” classes, e.g. for nurses in clinical training.
- Norwegian Network University (NITOL), NTNU as core partner:
  -- In 1994: cooperation between 4 colleges, 4 courses and 50 students.
    In 2000: 100 courses (also from UK & Netherl.), over 7000 students.
  -- Normal course costs 500 Euro, 3000 Euro/year for full time student.
    (University costs 10-15,000 Euro/year per full-time student.)
  -- Associated research in didactics and AI (e.g. for FAQs).
  -- Related EU projects:
    Ex. EONT, MECPOL, and DoODL on general issues.
    Ex. AQUARIUS to re-educate fish farmers.