Evaluating Distributed Computer-Supported Cooperative Learning (D-CSCL): A Framework and Some Data

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Overview

• An Evaluation Framework for D-CSCL
• VITAL - a D-CSCL Prototype
• Preliminary Evaluation Results
• Summary
D-CSCL Distributed Computer-Supported Cooperative Learning

- co-located - distributed
- synchronous - asynchronous
- guided - self-organized
- spontaneous - planned

- material (texts, slides, animations)
- communication (chat, audio, video)
- cooperation
  - shared workspace(s)
  - cooperative tools and methods
What is evaluated?

• What is the Unit of Evaluation?
  • cooperative learning as a pedagogical approach
  • specific cooperation method
  • specific D-CSCL implementation

• Who is the User?
  • one individual person
  • all cooperating persons individually
  • the group as a unit
What are the goals and criteria?

• What is the goal (evaluation question)?
  • Should system X be used in context Y?
  • Is system A better than system B?
  • Which aspects (of system X) need improvement?

• What are the proper evaluation criteria?
  • evaluate current system along preliminary criteria
  • evaluate current criteria along preliminary system
  • define level of evaluation
Levels of evaluation

- SC: socio-cultural
- OE: organisational-economical
- TF: technical-functional
- PP: pedagogical-didactical

Learning efficiency
- Amount
- Time
Virtual Teaching And Learning:
• cooperative hypermedia documents
• virtual room metaphor - different room types
• synchronous and asynchronous learning
• co-located and distributed learning
• learners have different roles (student, trainer)
A **chat-tool** supports text based communication.

Specific **roles** (trainer, learner) are distinguished.

A **shared whiteboard** is the cooperative working space.

Different **types of rooms** are distinguished by color (private, group, auditorium).

A **telepointer** supports synchronous communication by focusing attention.

By introducing links a **hypermedia document** of arbitrary complexity can be created.

Various **multimedia objects** can be integrated.

A **world-browser** informs about available rooms and current inhabitants of rooms.

**Group-awareness** is supported by images of the currently present learners in a room.
Preliminary Evaluation

• specific implementation

• all cooperating persons individually

• which aspects need improvement

• PP- and TF-level
Procedure

• seminar setting
• six students, one trainer
• 2 hour seminar session
• distributed and co-located group
• audio via multipoint telephone conference
• 1 hour VITAL-introduction one week earlier
• phases:
  • 1. presentation
  • 2. cooperative brainstorming
  • 3. Two groups in virtual rooms
  • 4. plenary discussion

• questionnaire
• silent observation
Results (questionnaire)

... is useful
... like more than previous
... enjoyed presentation
... participated more active
... questions facilitated
... enjoyed group work
... facilitates cooperation
... contribute to discussions
... move between rooms
... understood functions

rating scale (1 .. 5)
Results (silent observation)

- acceptance comparable to traditional seminars
- presentation phase too inactive
- group work enjoyed
- active contribution was not supported
- virtual rooms not immediately understood (double-structure of rooms and documents)
- group-awareness (beyond telepointer) problematic (group size > 3)
- importance of high audio quality
An extended architecture

Hypermedia Documents

Virtual Rooms

Learning Nets

Learning Protocols

contain
work with
inhabit
providerefer to
construct activate
manipulate
Summary

• Evaluation of D-CSCL environments needs a comprehensive evaluation framework
• VITAL - a general cooperative learning environment
• Evaluation of VITAL:
  • + satisfactory acceptance and usability of functions and group learning
  • - active contribution, group awareness
  • high quality audio, group size impact
• Extended architecture including learning nets and learning protocols