9 Cooperative Learning

References:

J. Haake/G. Schwabe/M. Wessner (Hrsg.): CSCL-Kompendium, Oldenbourg 2004 (Kap. 1.3, 1.5)

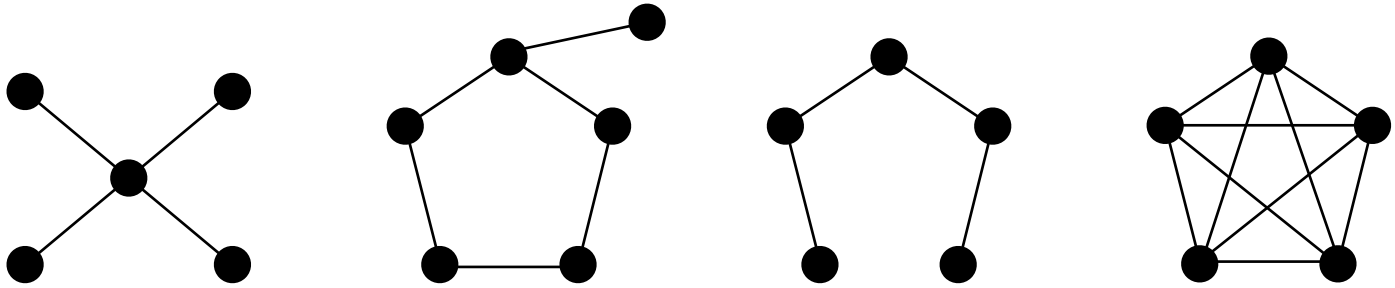
Clark/Mayer Chapter 11

What is a Social Group?

- "Groups satisfy individual needs as well as the needs of a community." (Döring)
  - Socio-emotional level: Group identity, transmission of social norms and values, social support
  - Factual-instrumental level: Partitioning of labor, transfer of knowledge
- Criteria (Döring 2003) (in contrast to transient interaction constellations):
  - Permanent (possibility of) communication
  - Separation from environment
  - Internal structure of group
  - Feeling of connectedness within group
  - Cooperation and mutual support
- Primary groups: High socio-emotional binding (family, friends)
- Learning groups are "secondary groups":
  - Group structure needs to be established
  - Therefore: Support connection establishment

Group Structures

- Communication networks



Wheel Circle Chain Network

Leavitt (1951)

Centralized (e.g. wheel):

– Effective for simple tasks (e.g. information search)

– Low satisfaction (except of center position)

Decentralized (e.g. circle, chain, network)

– Better for complex tasks

– Well-stabilized group may tend to again use centralized structures

Consequence:

Support decentralized structures, support negotiation of roles

Group Productivity

- *Potential productivity* is determined by:
  - Requirement level of group task
  - Human ressources
    - » Individual knowledge and skill
    - » Influences of interaction
- Process loss:
  - e.g. organizational problems, nervousness, tiredness
- *Real productivity:*
  - Potential productivity minus process loss

Steiner (1972)

Task Types and Group Work

4 dimensions for the definition of task types:

- Divisibility of task
- Maximization vs. optimization
- Relationship between individual and group performance
  - additive (e.g. brainstorming)
  - compensatory (e.g. estimation tasks)
  - disjunctive (e.g. mental exercise tasks)
  - conjunctive (e.g. playing music jointly)
  - scope of discretion for group
- Inter-Dependancy of group members
  - Cooperation
  - Competition
  - Mixture (may imply dilemma)

➢ Try to avoid competitive structures to ensure success of group work.

Steiner (1972)

Group Dynamics and Group Work

- *Social facilitation and inhibition:*
  Group work may have positive or negative impact of productivity
- Reasons for bad group productivity:
  - Loss of motivation: *social loafing* / *free riding*
  - Reluctance due to *evaluation apprehension*
  - *Production blocking* by non-optimal co-ordination of individual contributions
- Computer-supported collaboration:
  - Filtering of additional and meta information, e.g. anonymization
    - Anonymity often considered as uncomfortable in group situations
  - New obstacles, e.g. fear of creating data traces

Consequences:

- Co-operative tasks
- Reduce competition
- Avoid anonymity

Identity and Group Participation

- Majority influences
  - e.g. Asch experiment 1951 (acceptance of false majority opinion)
- Minority influences
  - Consistent position, presented by authoritative person
  - Polarization, categorization
- Social Identity Theory (SIT) (Tajfel, Turner 1979)
  - Participation in social groups as important part of self concept
  - Preference for own group *(in-group bias)*
    (Empirical evidence: Even in completely arbitrary formed groups)
  - Participation in various social groups
  - *Saliency:* Visibility of a certain social group
    - » Strengthens perception of difference to other groups

Consequences:

- Social stimuli (age, gender) as help for categorization
- Avoid salient situations for inter-group discrimination

Phases of Group Development

- *Forming* (orientation)
  - Socio-emotional level: Finding acceptable patterns of behavior
  - Task level: Approaching the group goal
- *Storming* (confrontation and conflict)
  - Socio-emotional level: Definition of positions and distribution of power
  - Task level: Organizational discussions
- *Norming* (consensus, co-operation and compromise)
  - Socio-emotional & task level: Development of standards
- *Performing* (Integration of task and socio-emotional requirements)
  - Socio-emotional: Standards in negotiation
  - Task level: Elaboration of solutions for group goals
- (Additional phase:) Transfer, closing und farewell
  - Dissolution of (learning) group
- Consequence:
  - Accept conflict as part of co-operation
  - Do not overly rely on computer-generated indicators for human behavior

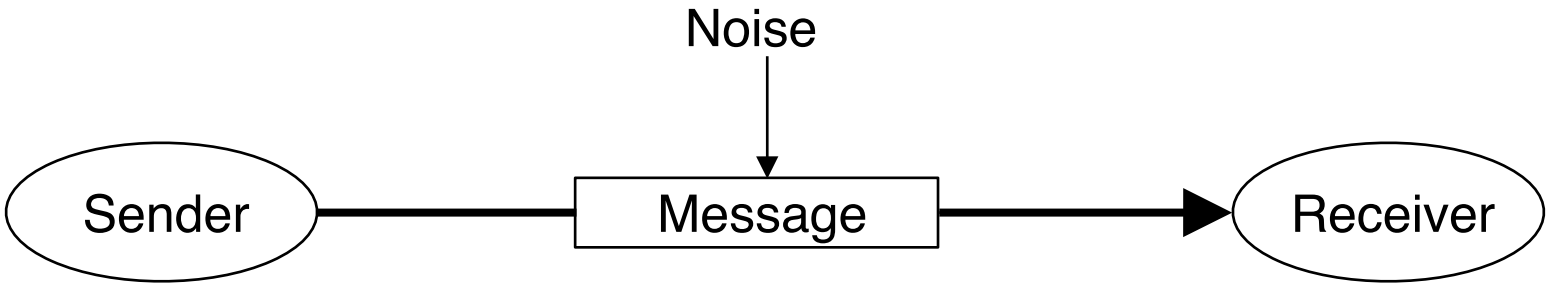
Tuckman (1965)

Leading a Group

- Determination of goals
- Orientation
  - Structure
  - Information flow
- Conflict resolution
  - Openness and tolerance
  - Working on upcoming conflicts
- (External) representation
- Styles of leadership
  - authoritative
  - democratic
  - laissez-faire
  - co-operative

Models of Human Communication (1)

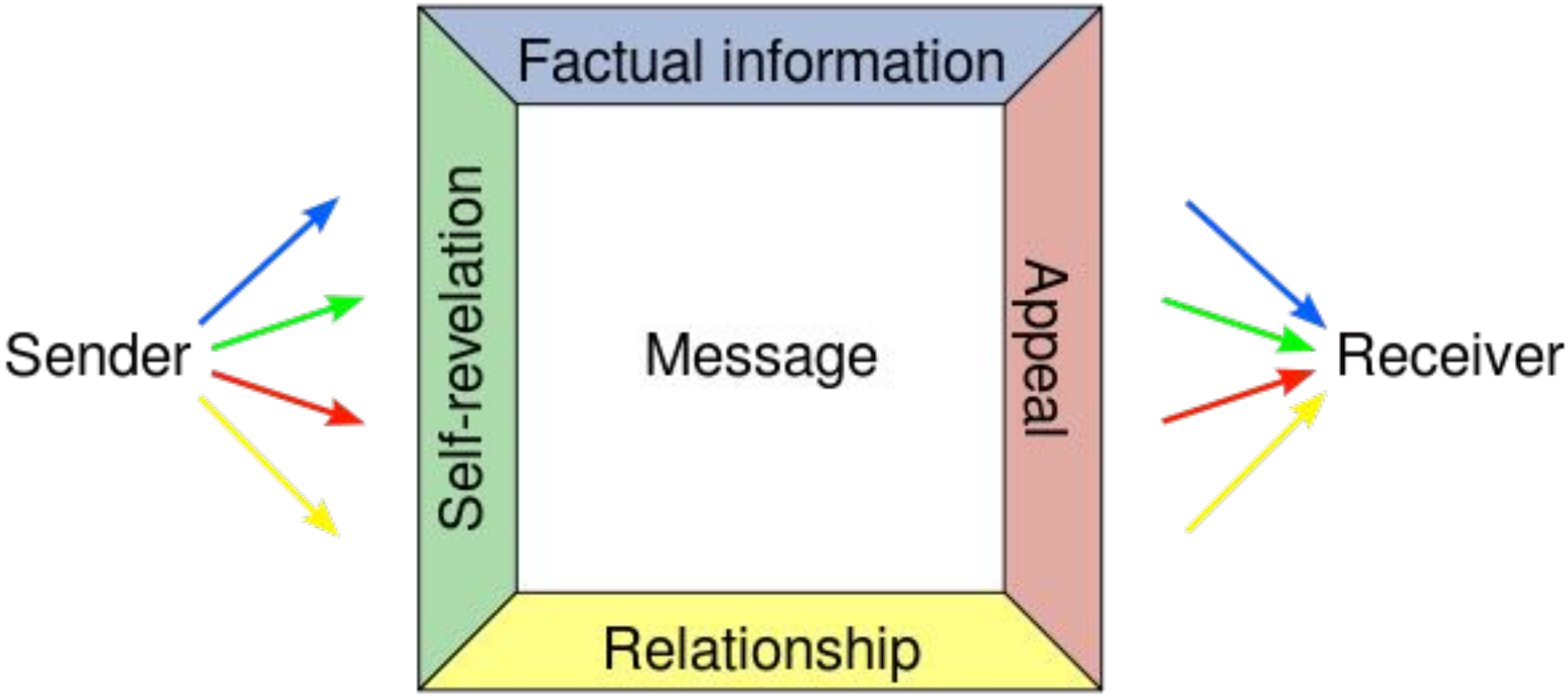
- Shannon/Weaver (1949)



How does this correspond to learning theories?

Models of Human Communication (2)

- Four-sides model of communication (Schulz von Thun, 2001)



Picture: Wikipedia

Human Communication in Group Learning

- ***Please evaluate the information on human communication regarding its impact on group learning, in particular computer-supported group learning!***

Co-Operative Learning: Opportunities and Hurdles

- Opportunities:
  - *to be filled in lecture*
- Hurdles:
  - *to be filled in lecture*

Suitable Learning Tasks for Group Learning

- ***How can we characterize learning tasks/goals, which lend themselves to group learning?***

9 Cooperative Learning

References:

J. Haake/G. Schwabe/M. Wessner (Hrsg.): CSCL-Kompendium, Oldenbourg 2004 (Kap. 1.1, 3.5)

Computer-Supported Cooperative Work (CSCW)

Ellis, Gibbs, Rein 1991, definition of *groupware*:

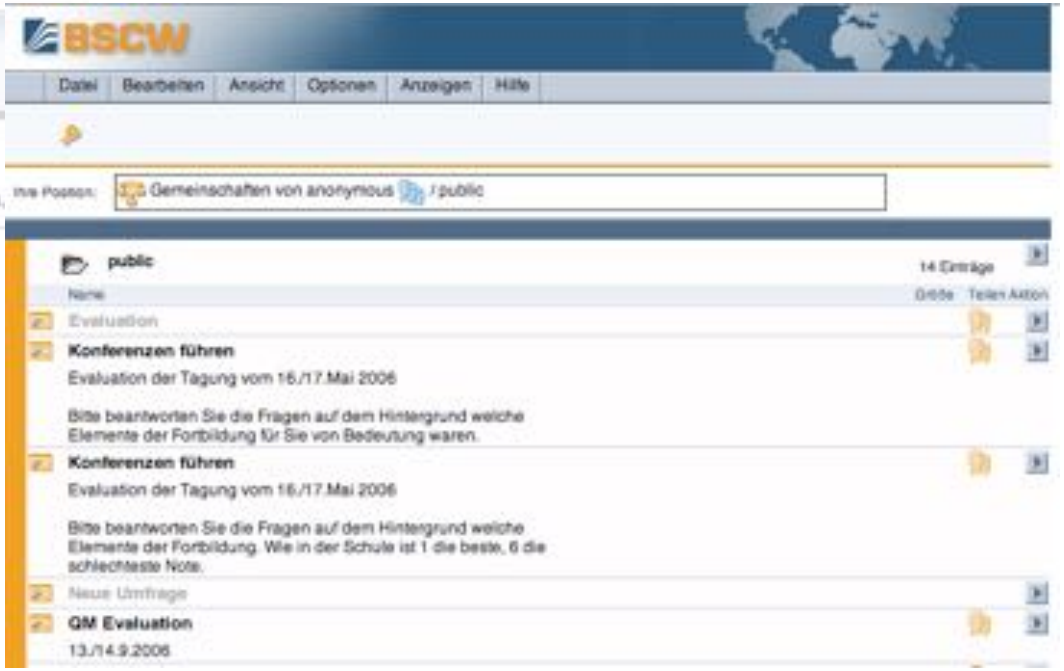
"computer-based systems that support groups of people engaged in a common task (or goal) and that provide an interface to a shared environment."

- Example functions:
  - Messaging systems
  - Multi-user editors
  - Virtual meeting rooms
  - Conferencing systems
  - Joint information spaces
  - Coordination systems
- CSCW functions have become everyday experience in modern Web:
  - Open Source Development, Wikis, Chats, Skype, Dropbox, Google Docs, …

History of CSCW: Jonathan Grudin, "Computer-Supported Cooperative Work: History and Focus," *Computer*, vol. 27, no. 5, pp. 19-26, May 1994, doi:10.1109/2.291294

Traditional Groupware Systems

IBM Lotus Notes 8



CSCL

- **C**omputer-**s**upported
  - **c**ollaborative/ **c**ooperative/ **c**ollective/ **c**ompetitive/ **c**onversational

  Learning (in analogy to “CSCW”)
- Cooperative Learning:
  - Learning in a group
  - Joint construction of knowledge
- Example functions:
  - Jointly used material collections
  - Collaboration functions for joint elaboration of solutions
  - Knowledge management
  - Participant and role management

Theoretical Background for CSCL

Do you remember theories which were discussed earlier in the lecture and which relate to CSCL?

Time Space Matrix

	same place	different place, predictable	different place, unpredictable
same time (synchronous)			
different time (asynchronous), predictable			
different time (asynchronous), unpredictable			

DeSanctis/Gallupe 1987, Grudin 1994

Fill in examples!

Time Space Matrix

	same place	different place, predictable	different place, unpredictable
same time (synchronous)	Computer-supported communication		
different time (asynchronous), predictable		Computer-mediated communication	
different time (asynchronous), unpredictable			

DeSanctis/Gallupe 1987, Grudin 1994

Further Dimensions of CSCL

- Symmetry
  - Knowledge transfer (asymmetric) or joint knowledge construction (symmetric)
- Control mechanism
  - Controlling person or implicit self-control
- Duration
  - Temporary learning group or community of learners (cf. chapter 3)
- Social form
  - Type and size of group
  - Interaction styles
- Knowledge goals
  - Individual goals or group goals

Tools for Work Coordination

Computer-Mediated Communication				
Channels	Asynchronous communication		Synchronous communication	
	2 partners	>2 partners	2 partners	>2 partners
Text	E-Mail	News Groups	Chat Instant Messaging	Chat Instant Messaging
Audio	(Atttachments, Uploads)		(VoIP) telephony	Phone conferences
Video			Video conference	Multipoint video conference

Cooperation Tools for Small Groups (1)

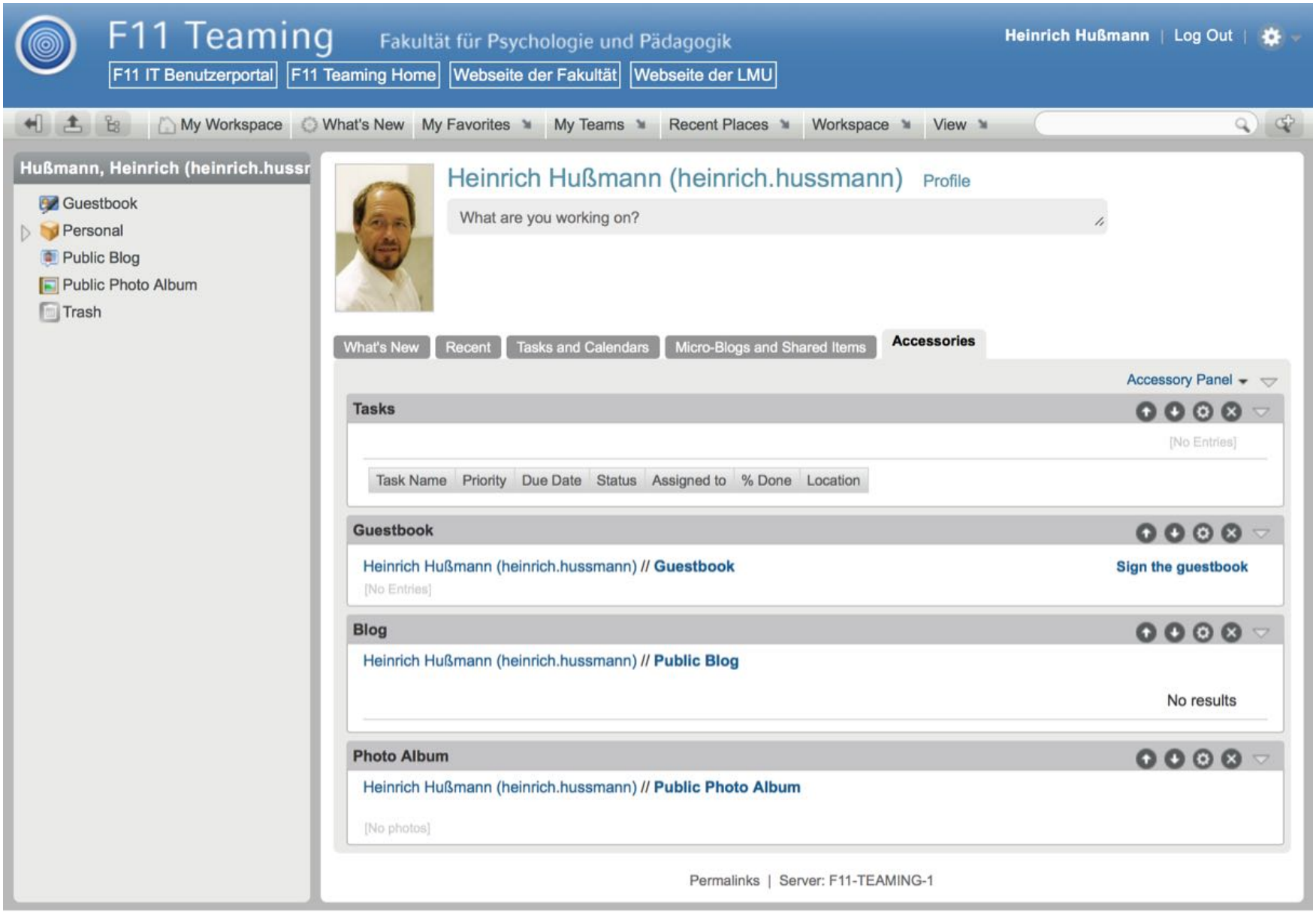
- Min. 2, max. 10 participants
- ***Awareness functions***:
  - Participants are able to observe what others are doing
  - State of participant
    - » e.g. current contribution is available, is allowed to speak
  - Context of participant
    - » Environment-specific activities and properties, e.g. role
  - State of jointly used objects
    - » e.g. updated version
  - Group activity
    - » e.g. transition into new phase
  - Individual activities
    - » e.g. moving a file

Cooperation Tools for Small Groups (2)

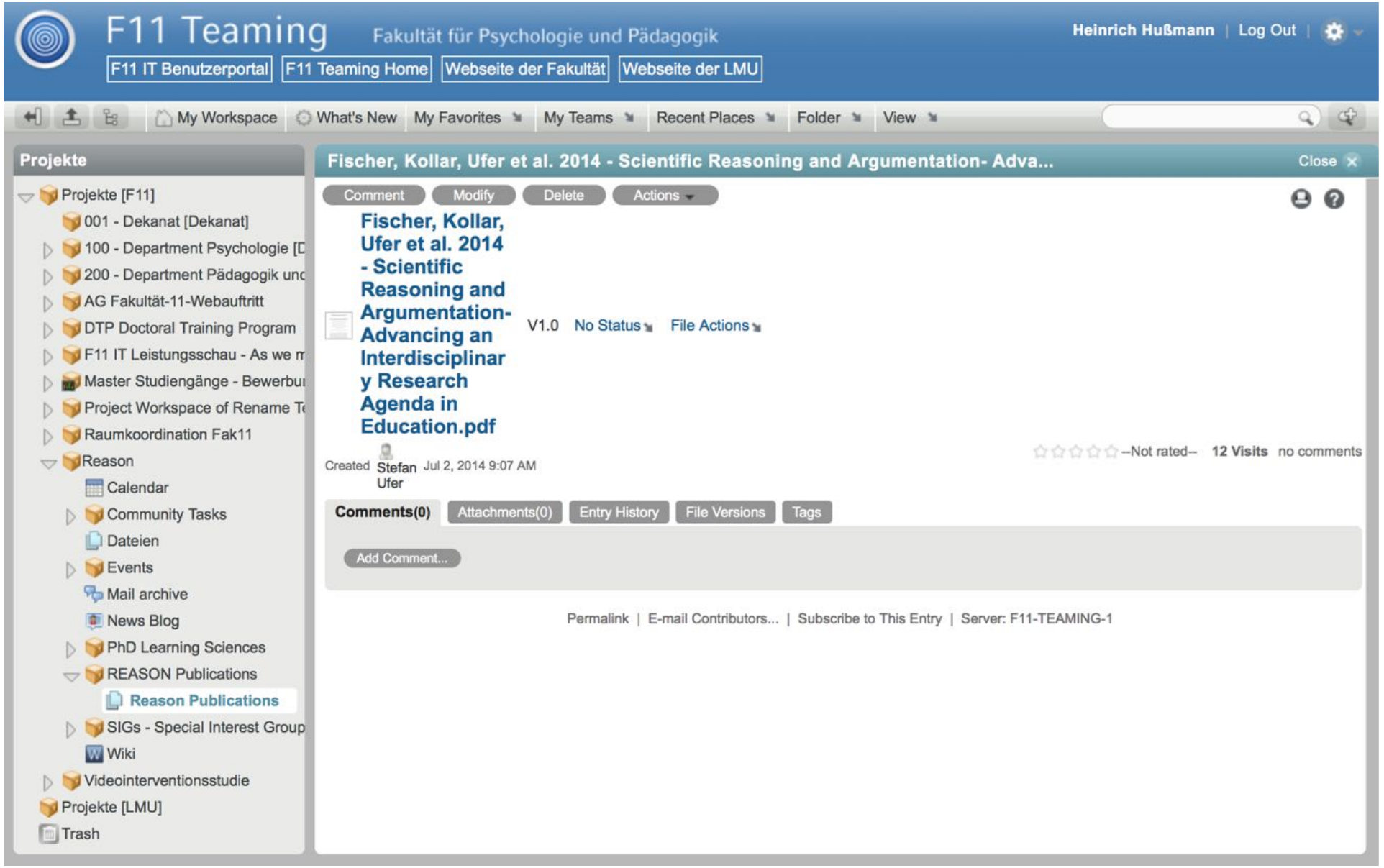
- Joint data repository
  - Shared objects, status, access rights
- Co-operative editing
  - Simultaneous modifications by several users
  - Fine-granular locking
  - Mechanisms to deal with conflicting activities
    - e.g. several cursors, "floor control"
- *Application Sharing:*
  - Embedding of standard applications into joint workflow

- ***Is it possible that such mechanisms create conflicts with self-determination principles?***

Example (2015): LMU F11 Teaming (1)



Example (2015): LMU F11 Teaming (2)



9 Cooperative Learning

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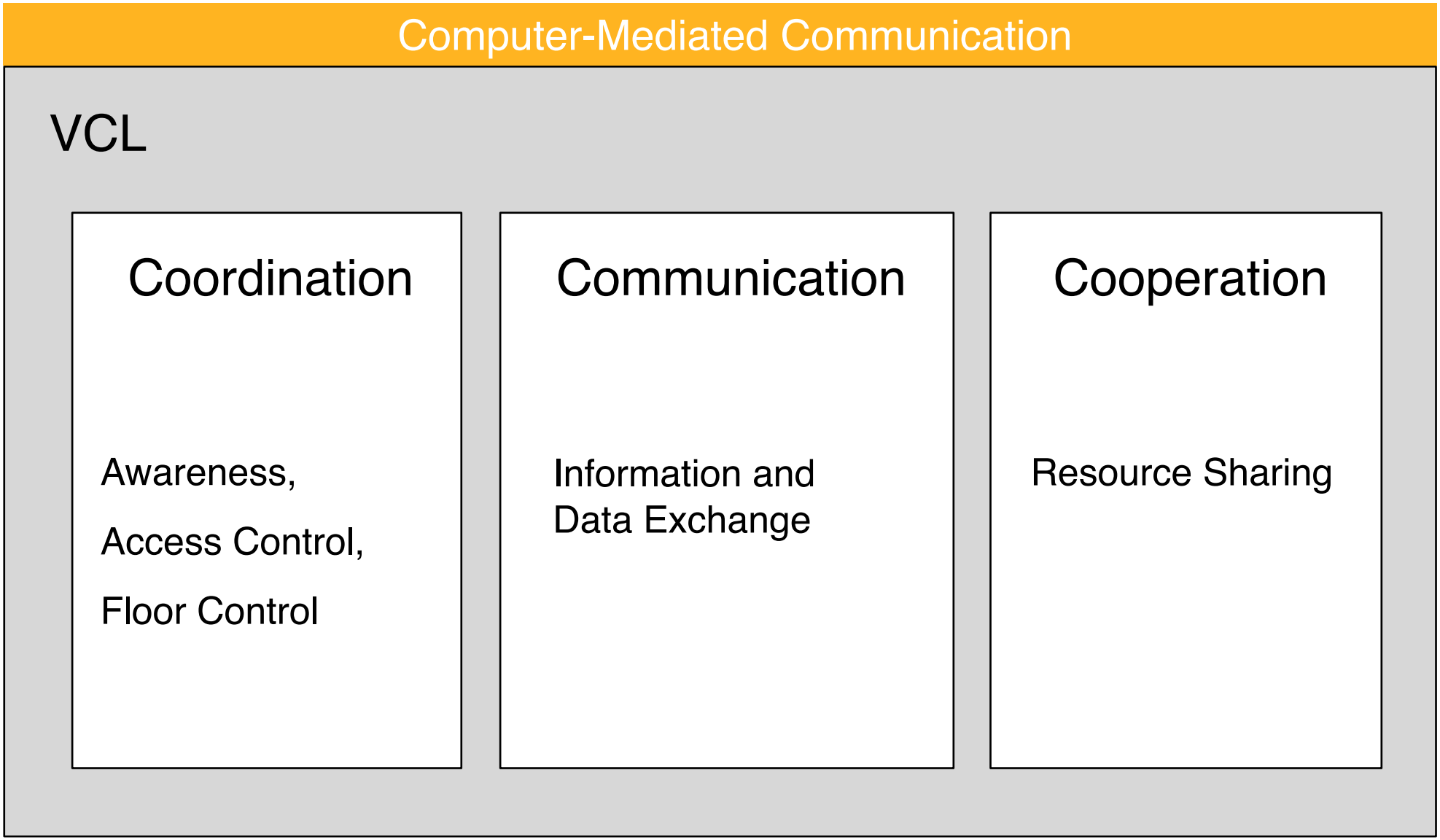
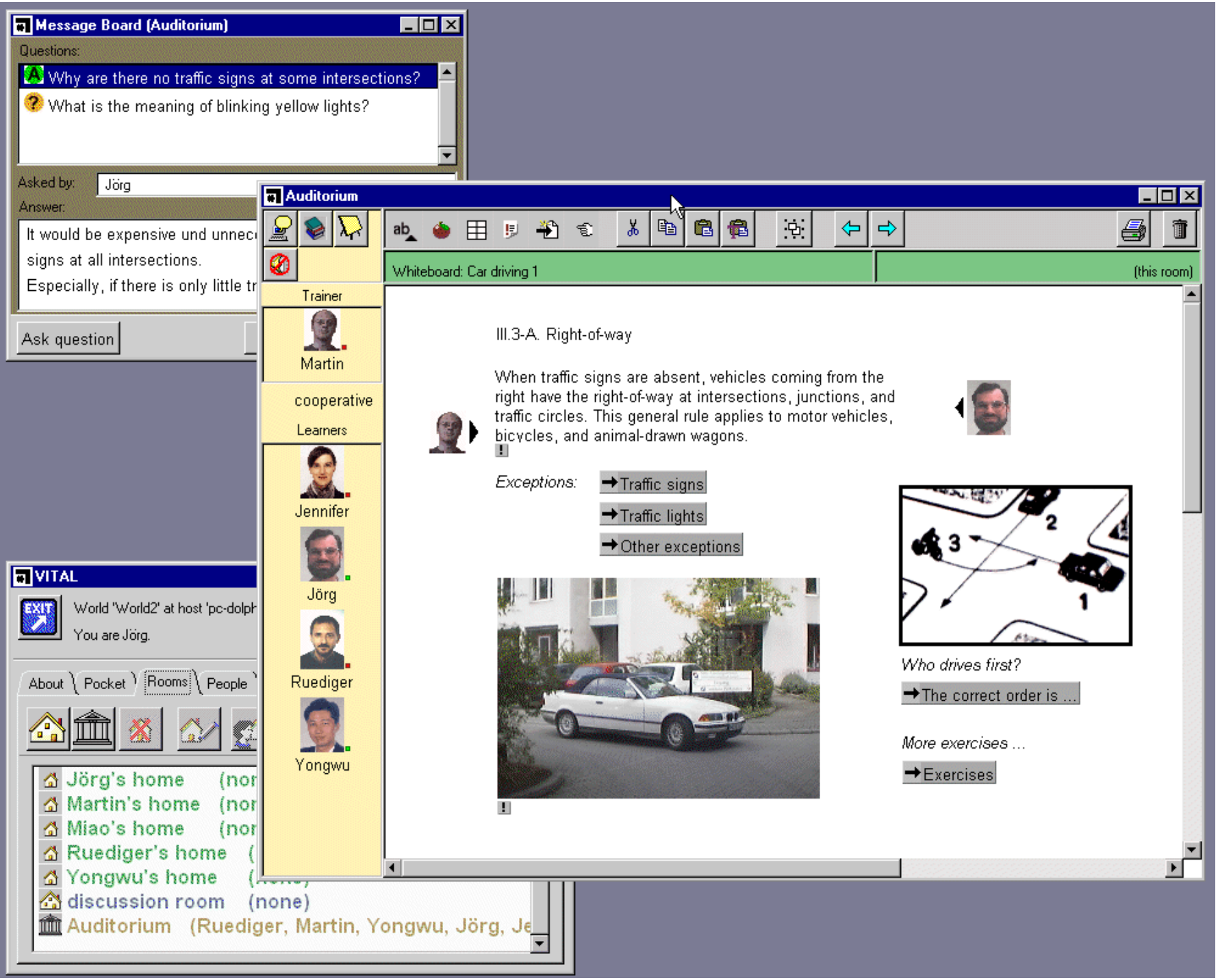
Virtual Cooperative Learning Space (VCL)



(Historic) Example: VITAL

- Virtual Teaching and Learning (GMD-IPSI 1999)
- Virtual learning world, hypermedia, audio communication
- Joint reading of learning materials
  - Awareness functions, e.g. *telepointer* (carrying a picture of owner)
- Chat & Audio
- Specific learning situations:
  - Private learning space
  - Group learning space
  - Auditorium


Message Board (Auditorium)
Questions:
Why are there no traffic signs at some intersections?
What is the meaning of blinking yellow lights?
Asked by:
Jörg
Answer:
It would be expensive und unnec
signs at all intersections.
Especially, if there is only little tr
Ask question
Auditorium
Whiteboard: Car driving 1
(this room)
Trainer
Martin
cooperative
Learners
Jennifer
Jörg
Ruediger
Yongwu
III.3-A. Right-of-way
When traffic signs are absent, vehicles coming from the right have the right-of-way at intersections, junctions, and traffic circles. This general rule applies to motor vehicles, bicycles, and animal-drawn wagons.
Exceptions:
Traffic signs
Traffic lights
Other exceptions
2
3
1
Who drives first?
The correct order is ...
More exercises ...
Exercises
VITAL
EXIT
World 'World2' at host 'pc-dolph
You are Jörg.
About
Pocket
Rooms
People
Jörg's home (nor
Martin's home (nor
Miao's home (nor
Ruediger's home (
Yongwu's home (
discussion room (none)
Auditorium (Ruediger, Martin, Yongwu, Jörg, Je

iSocial: 3D Virtual Learning World

http://isocial.missouri.edu/

Science Learning in Second Life

www.youtube.com/watch?v=EfsSGBraUhc

Trends 2014 (According to NMC)

- NMC (New Media Consortium) Horizon project
  - Collecting trends in technology for higher education
  - Published every year, created by asking experts
- Main *fast trends* 2014:
  - Growing ubiquity of social media
  - Integration of online, hybrid and collaborative learning
- ***How is the topic of Social Media related to Collaborative Learning?***

Long-Term Trend: Learning Analytics

- NMC Report 2014, mid-range trend:
  - Rise of data-driven learning and assessment
  - Learners leaving a data trail
  - Learning analytics: analyze data on behavior of learners
- NMC Report 2015, mid-term trend:
  - Growing focus on measuring learning
- Concrete example:
  - Iowa Community College Online "Early Alert" system
  - Dashboard for instructors identifying at-risk students
  - See http://nextgenlearning.org/grantee/iowa-community-college-online-consortium
- ***Is this a positive development judging in terms of motivation theory?***

An instructor dashboard identifies at-risk students, defined as those who have not submitted an assignment in the last 10 days, have not logged into the course for 120 hours, or whose course grade falls below 72 percent.