Collaborative video based teacher training in a virtual learning environment

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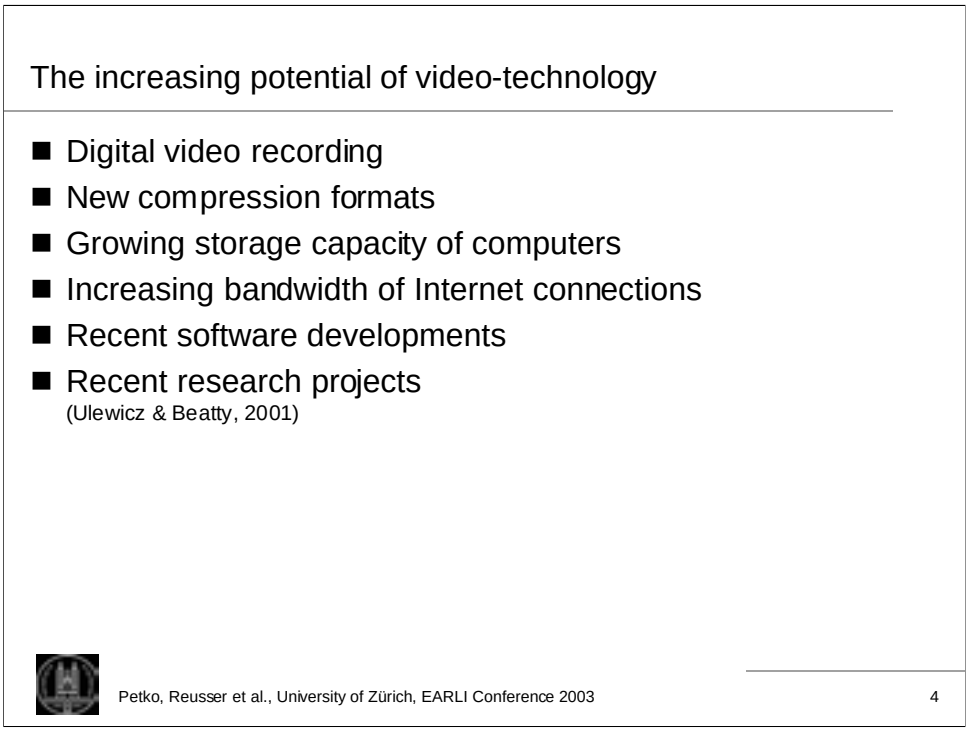
The topic is not videoconferencing, this is a hot topic too, but learning from pre-recorded videotapes by watching and discussing these tapes. The videos are records of classroom teaching from the international TIMSS 1999 Video Study. We used a new specialized online- platform to discuss these videos with students of educational psychology, the majority are teachers themselves. We have the hypothesis that this way of learning can promote a deep reflection of classroom teaching and we will present three exploratory case studies to illustrate that.

Overview

- Video-based learning: recent developments
- LessonLab Viewer™ - a tool for video-based learning
- Three exploratory case-studies with LessonLab Viewer™
- Results from the exploratory case-studies
- Final remarks

1. Video-based learning
Recent developments



Recent developments in video- and computer-technology has led to extended possibilities of these tools.

Better quality: Compared with analog VHS videos, digital video formats increase the quality of the picture and of the sound. Today digital video is commonly used and a digital videocamera can be bought quite cheaply compared to the costs about ten years ago.

Better storability, distributability, handling: New compression formats: Quicktime, RealVideo, Windows Media, DivX make it easier to store and exchange video material. Today harddisks of a storage capacity of 250 GB cost about 300 Dollars, about five years ago that would have been 30000 Dollars. With an ADSL or cable connection, gives us the opportunity to streamvideodata in real time over the internet

Better interactivity: Recent software developments are allowing for a use of videodata that goes beyond the possibilities of just playing and viewing it. We will show that later

Recent research projects (e.g. TIMSS) have developed categories of how to analyze and compare videos of classroom teaching

Reference: Ulewicz, M. & Beatty, A. (2001). The Power of Video Technology in International Comparative Research in Education. Washington D.C.: National Academy Press.

Linking the potentials of digital videodata and online-learning-platforms

- Learning with Videodata
  - Can be stopped, replayed and reanalyzed
  - Can be analyzed from multiple perspectives
  - Can be analyzed focussing different criteria
  - Bridge the gap between theory and practice

- Learning with CSCL
  - Time and place flexibility
  - Provide rich additional material
  - Multimediality and hypertextuality
  - Written asynchronous discussions ⇨ deep argumentation
  - Knowledge building communities

Dimensions of teaching and learning with videodata

- Types of media
- Types of content
- Types of learning activities

We will make some basic distinction in the ways of video-based teaching and learning. There are different types of media, different types of content and different types of learning activities possible ...

Video-based learning: Types of media

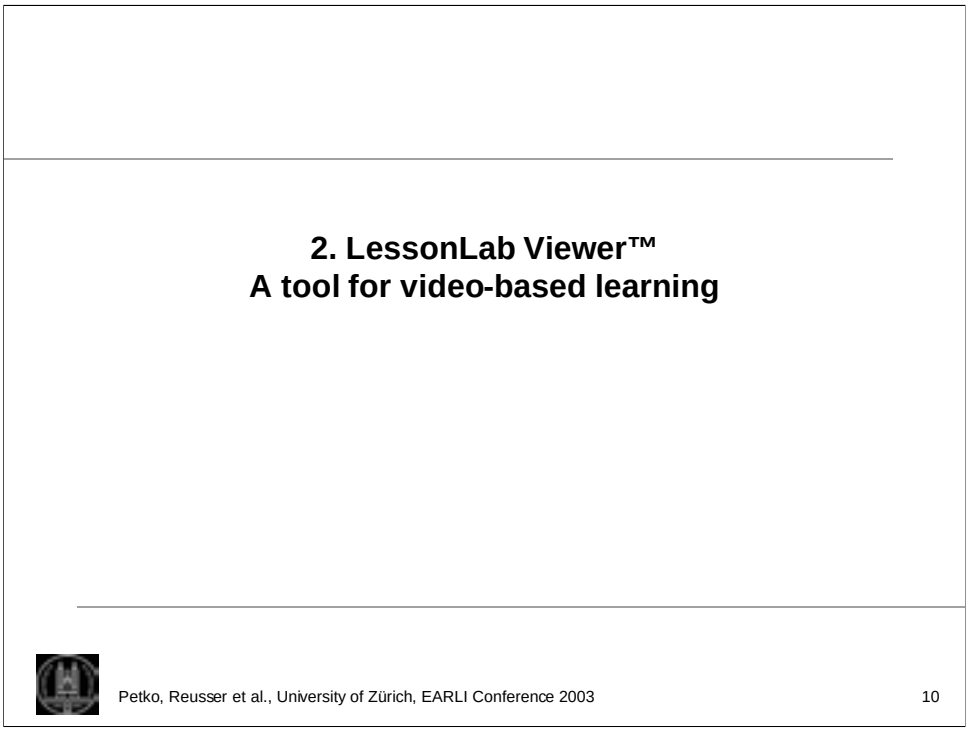
- VHS
- Video-CD
- DVD
- Extended interactivity (CSCL)

Video-based learning: types of content

- Own videos ⇦⇨ Videos of others
- „Ideal cases“ ⇦⇨ „Normal cases“
- Without add. info. ⇦⇨ With add. info. (theory, comments...)
- Single lessons ⇦⇨ A set of lessons
- Entire lessons ⇦⇨ Short sequences

Video-based learning: Types of learning activities

- Watching, imitating ⇦⇨ Discussing, searching alternatives
- Free observation ⇦⇨ Observation based on learning tasks
- Single learner ⇦⇨ Group of learners
- Without tut. support ⇦⇨ With tutorial support
- Online learning ⇦⇨ Blended learning



LessonLab Viewer is a tool for collaborative video-analysis over the internet. It has been developed as a tool for knowledge building communities by LessonLab Co. in Los Angeles under Supervision of Prof. Jim Stigler UCLA.

As Collaborators of the TIMSS 1999 Videostudy we had the opportunity to test this tool in our case studies.

The LessonLab - Portal ™

The shell of this software has many of the functions of a usual web based learning platform...

Password-protected access...

Workgroups and tasks

Content delivery

Announcements

Time schedule

Tasks

Forums

(Testing functionalities are missing., due to the fact that this software was build for knowledge-building communities, not for university courses)

New: Integration of video in the basic functionalities - video markers

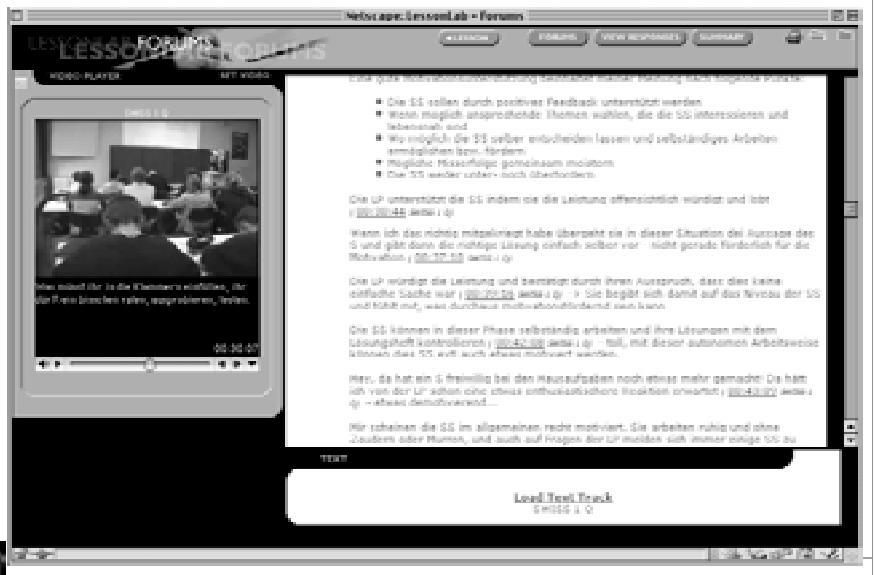
Using video-markers to link video with a transcript

Link transcripts with video

Inserting video markers in discussion postings

Show interesting moments by inserting video markers in discussion postings

Using video-markers to show what you see



This is how video markers look like in discussion postings. By klicking on a video marker the videoplayer jumps to the specified timecode and starts playing.

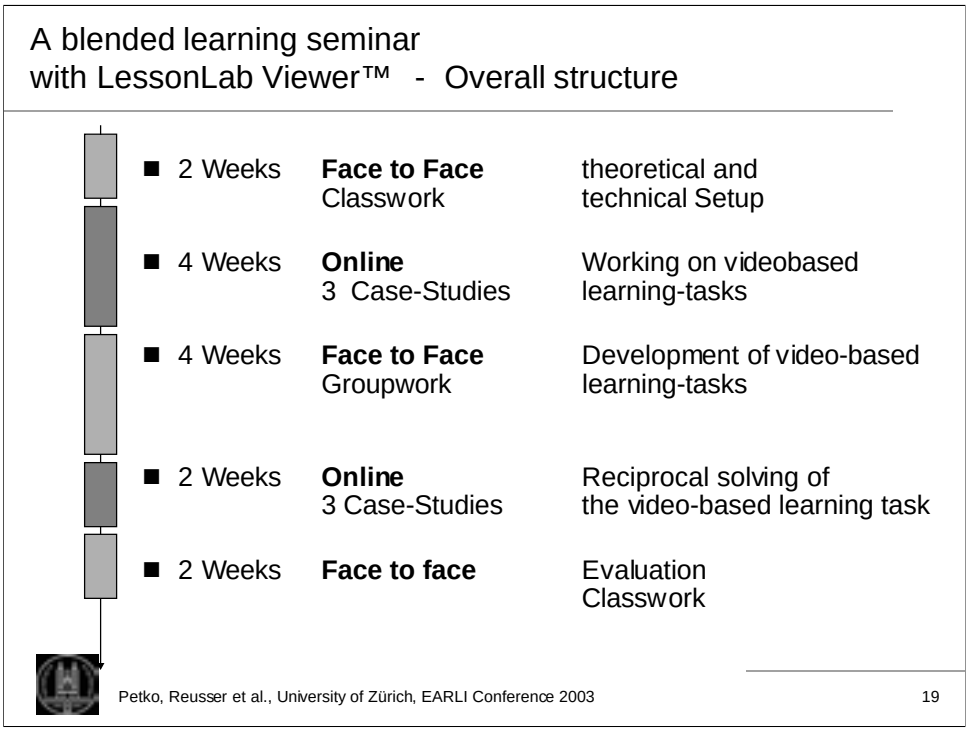
Using video-markers to assign observation tasks

Question-answer tasks can be assigned and the results can be made visible as soon as one student or all students have completed the task....

Observation task example: rate and comment video sequences

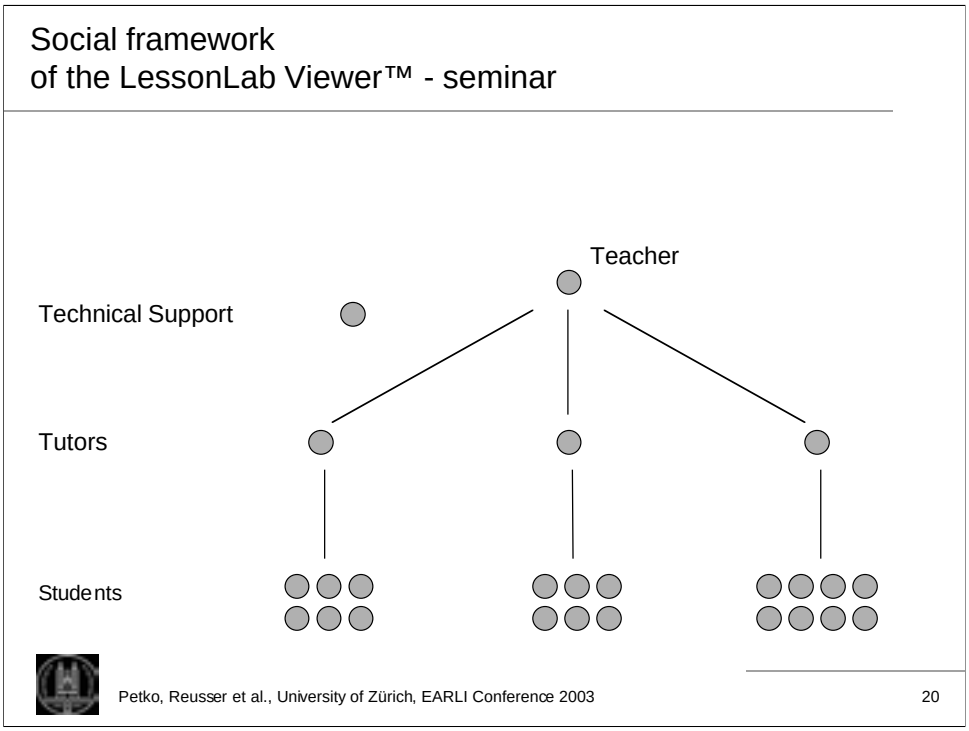
Rating tasks can be assigned and the results can be made visible as soon as one student or all students have completed the task.

3. Three exploratory case-studies with LessonLab Viewer™



At the university of Zurich we have conducted a blended learning seminar in the summer semester of 2003 using the software Lessonlab Viewer™. The topic of the seminar is the question of teaching quality in swiss classrooms. 20 advanced students of educational psychology, 3 research assistants, a tecnical supporter and a university professor are collaborating in this seminar.

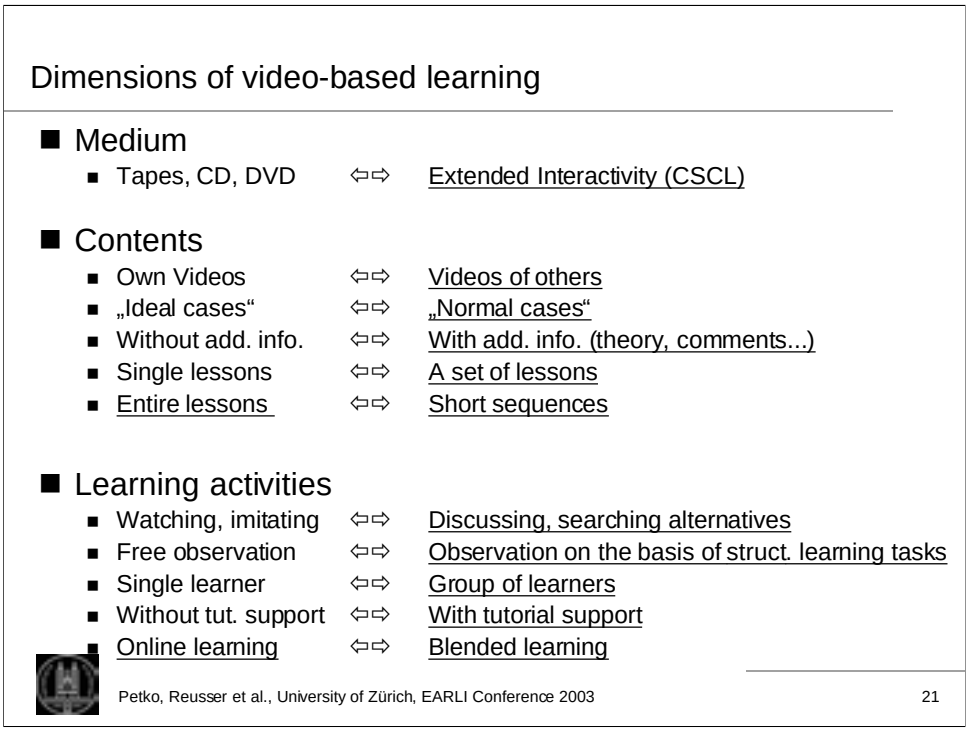
You can see the overall structure in the figure shown. There are two online phases and three face to face periods that alternate...



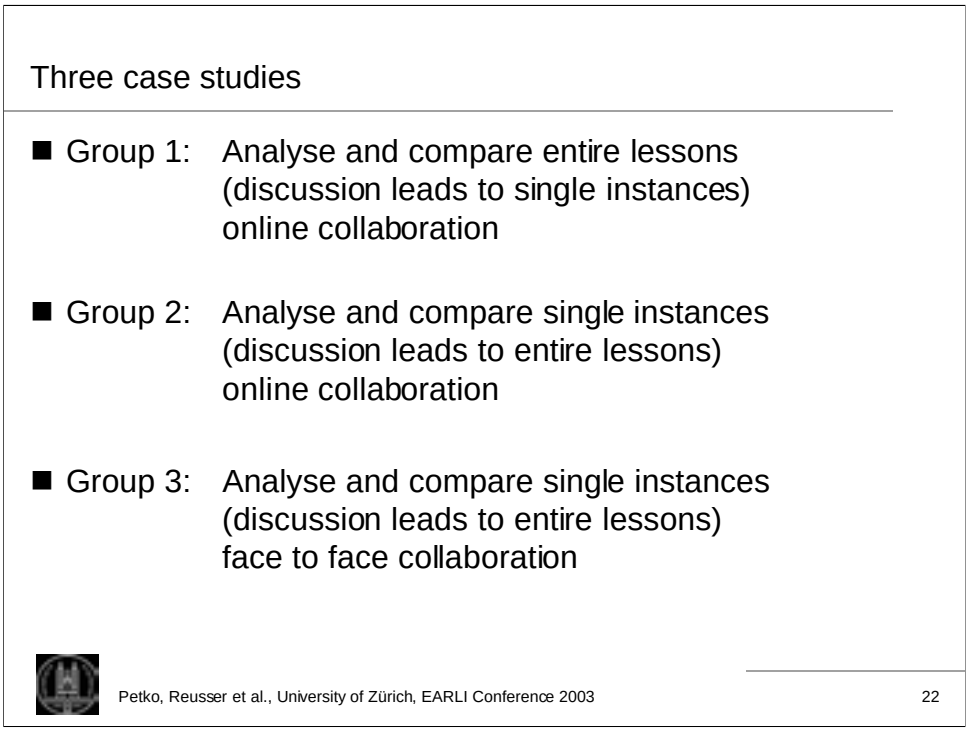
The social framework of the seminar is grouped like this. The 20 students are grouped in 3 tutorials where they work in tandem teams and in groups.

We provide an intensive technical support to all students, which is done by a single person, not by a tutor.

The teacher, that is the university professor takes the role of a supervisor and mentor of the entire process.



Underlined aspects were applied in the three case studies



The three groups had different tasks, working with the videodata.

The case studies were designed in collaboration with my collegues Isabelle Hugener and Kathrin Krammer from the University of Zurich.

Typical tasks discussing videodata are:

- describe ...
- rate/judge ...
- compare ...
- search ...
- discuss ...
- imagine context where this is good/problematic teaching ...
- think of alternatives ...

Example tasks: Group 1

- „Watch the following lesson and describe the overall structure, the specific logic, the supposed lesson goals...“
- „Compare the description with the one of your teammate and discuss your opinions in your discussion forum...“
- „Compose a ‚team commentary‘ of the lesson you have described... Point out what is good, what can be improved...“
- „Watch the other Videos and read the commentaries of the other teams. Give them a feedback on their commentary...“

Example Tasks: Group 2 (online) and Group 3 (face to face)

- „Compose a list of descriptors of good classroom teaching and compare your list with the list of your teammate ... “
- „Watch the following sequences and answer the questions... How clear is the goal statement in minute 00.15.29-00.15.58? Rate this on a scale from 1 - 5 and write a short explanation of your judgement. ...“
- „Compare your answers with the answers of other group members. Discuss aspects where you have a different opinion“
- „Review two entire lessons for a more comprehensive view ...“

Hypotheses commonly found in the literature

- Students working on entire lessons get a more comprehensive knowledge than students working on isolated sequences.
  (Hiebert, Gallimore & Stigler, 2002, Derry and STEP, 2002)

- Students working in a blended learning environment, e. g. discussing their ideas face to face, get a better understanding than students studying completely online.
  (Dennis & Valacich, 1999; Hofmann, 2001; Barbian, 2003; Bonk et al., in press)

- **>>** Group 1 and 3 should perform better than group 2.

Barbian, J. (2003). *Blended Works: Here's Proof.* Available: http:\\onlinelearningmag.com/training/search_display.jsp?vnu_content_id=1526767 (24.6.2003).

Bonk, C.J. (in press). Ten years of collaborative learning online: Myth, magic, orjust a lot of Bonk? *Training Agenda Magazine*.

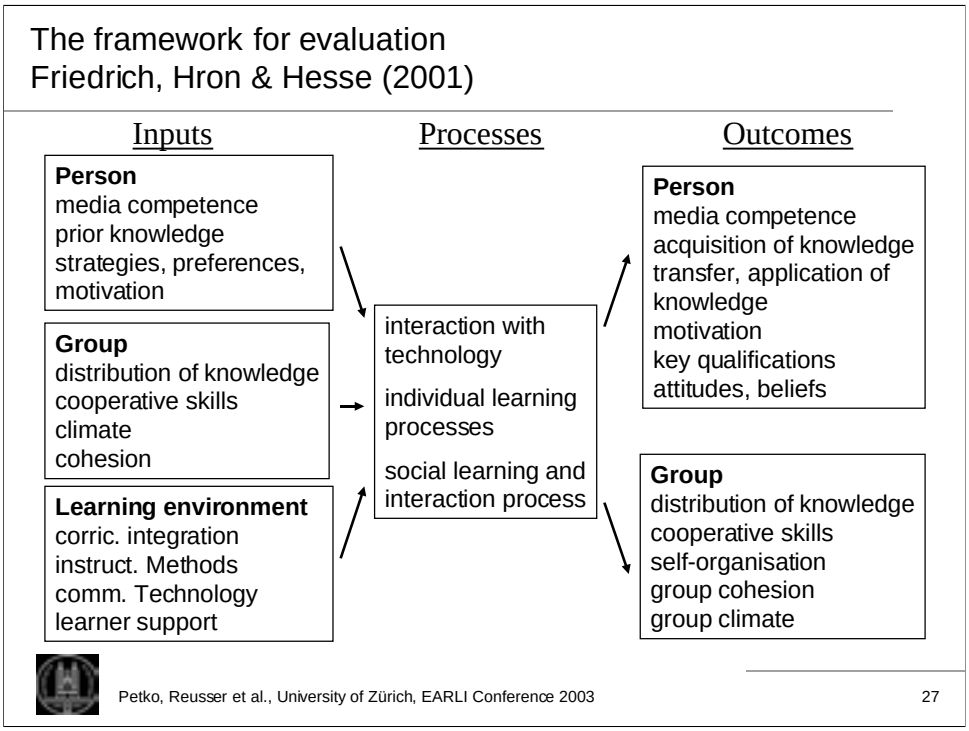
Dennis A.-R., Valacich, J. S. (1999). Rethinking Media Richness: Towards a Theory of Media Synchronicity. *HICSS* 1999

Derry, S. J. & STEP Team (2002). STEP System for Collaborative Case-Based Teacher Education: Design, Evaluation & Future Directions*. Computer Support for Collaborative Learning (CSCL '01)*. Mahwah, NJ: Erlbaum.

Hiebert, J., Gallimore, R., Stigler, J.W. (2002). A Knowledge Base for the Teaching Profession: What Would It Look Like and How Can We Get One? *Educational Researcher* 31(5), 3-15

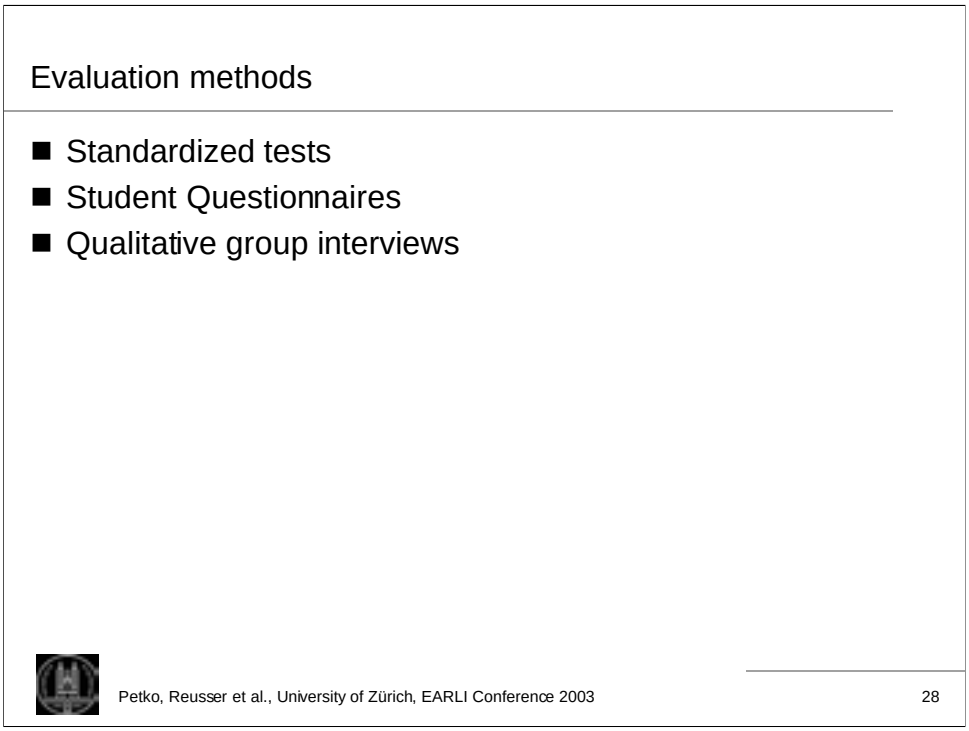
Hofmann, J. (2001). Blended Learning Case Study. *ASTD's Online Magazine All About E-Learning.* Available: Http: www.learningcircuits.org/2001/apr2001/hofmann.html.

4. Results from the exploratory case studies



Friedrich, H. F., Hron, A., Hesse F. W. (2001). A Framework for Designing an Evaluating Virtual Seminars. European Journal of Education, 36 (2), 157-174

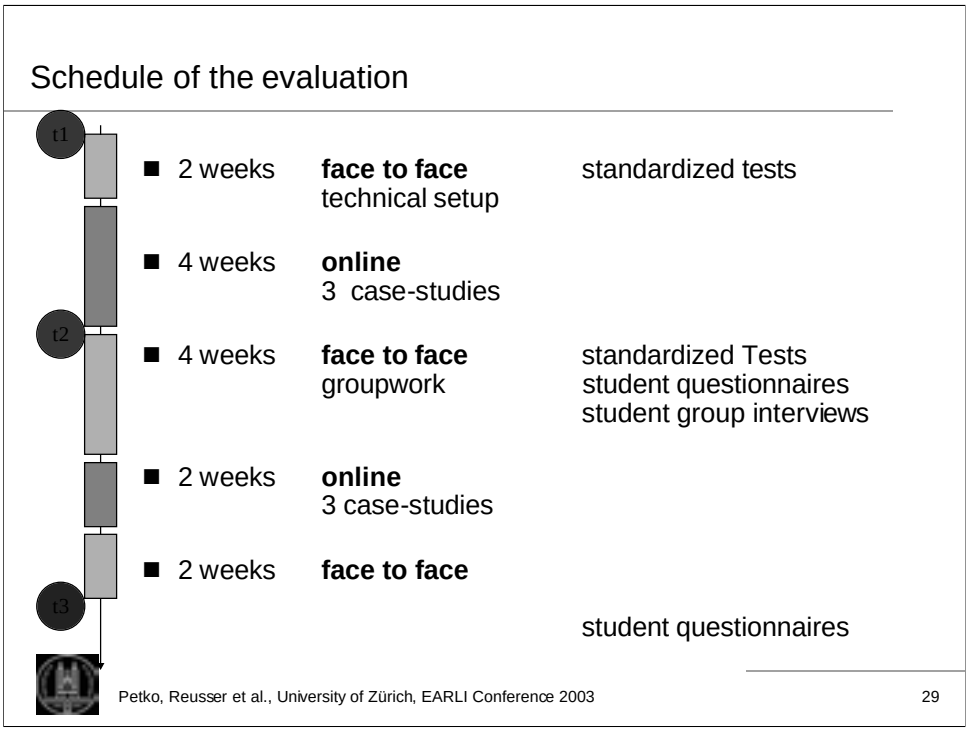
Extended Input-Process-Outcome framework. Our evaluation tried to cover these aspects. I will only show parts of the evaluation...



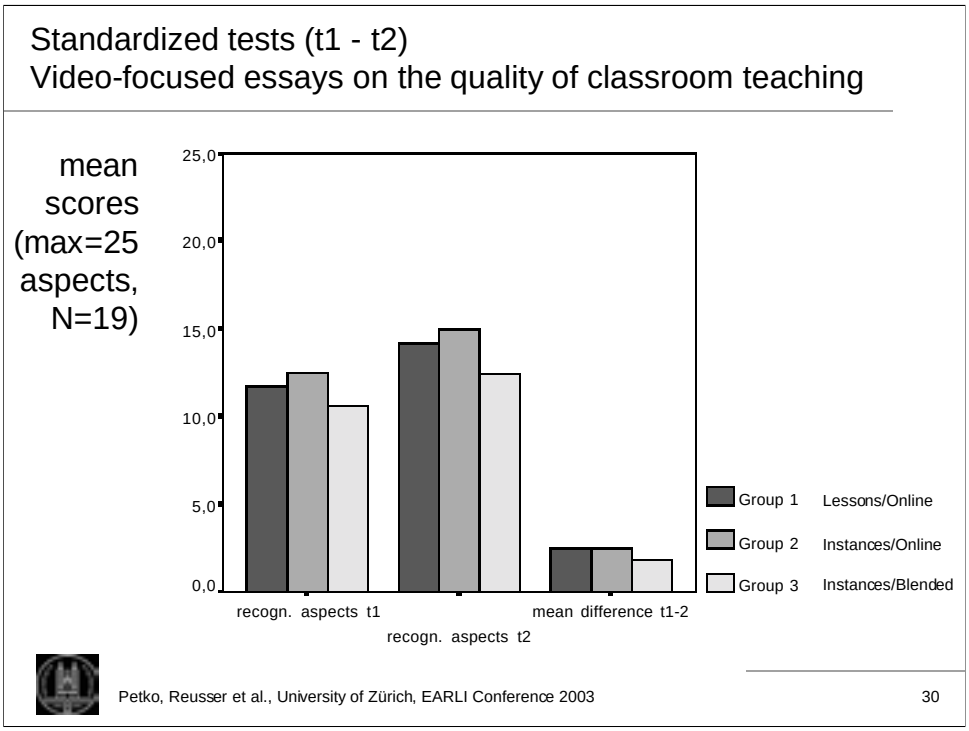
Standardized test: Students are watching a lesson and writing an essay on the qualities of classroom teaching that can or can not be observed in this lesson. The Essays were coded with regard to the quantity of recognized aspects and rated regarding the connectednes, the multiperspectivity and the coherence of the description.

Student questionnaires asked the students to get the individual judgements on Input, Process and Output Variables as specified in the theoretical model.

Qualitative group interviews were used as the most exploratory way to examine the personal experiences within the context of each learning group.



The evaluations that I will present today are related to the first online phase (t1-t2).

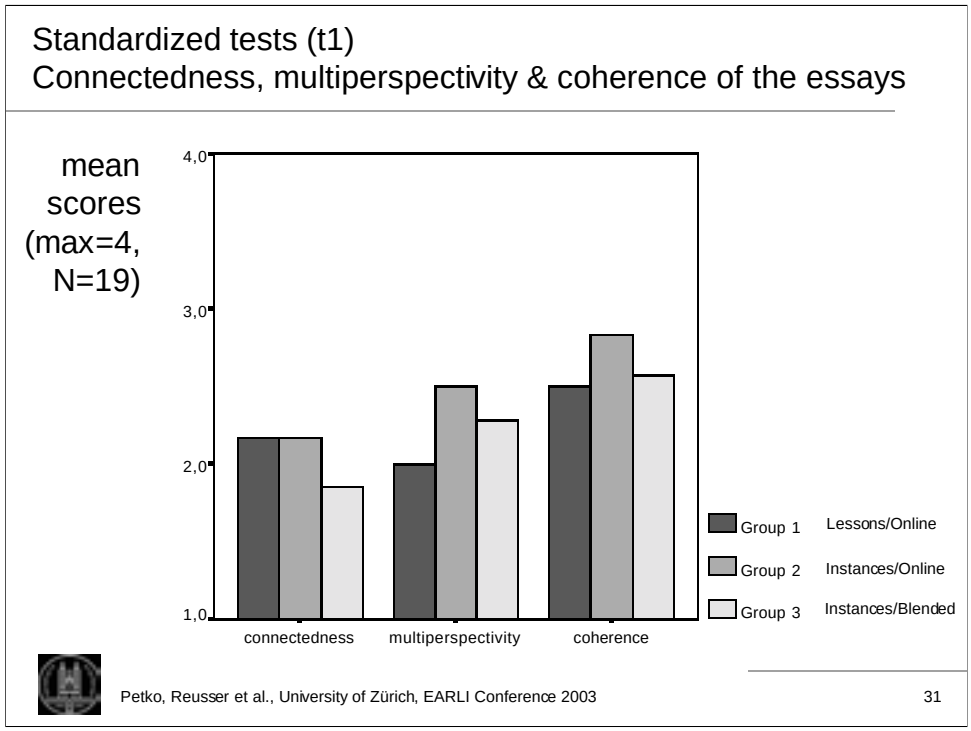


Before and after the 4 weeks online-course students were obliged to write a video-focused essay, judging the quality of the lesson shown.

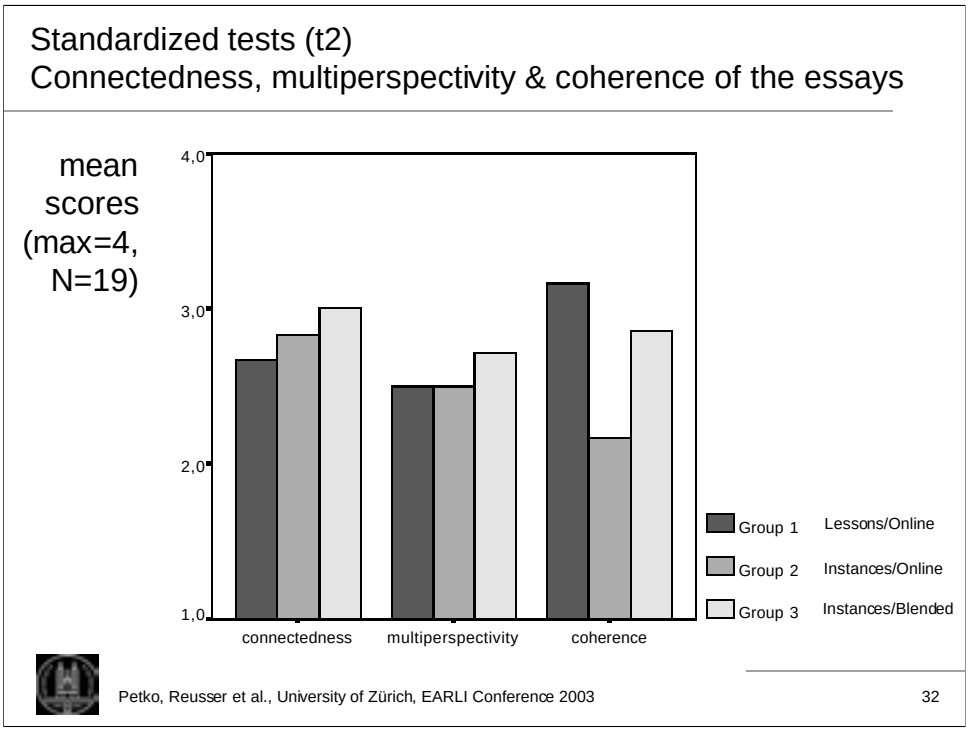
The essays were coded by a set of 25 aspects of classroom teaching. The aspects were developed by

Clausen, M., Reusser, K. & Klieme, E. (2003). Unterrichtsqualität auf der Basis hoch-inferenter Unterrichtsbeurteilungen. *Unterrichtswissenschaft, 31*(2), 122-141

As You can see on the chart, the students were able to recognize more aspects after the treatment). Differences between the three groups were minimal.

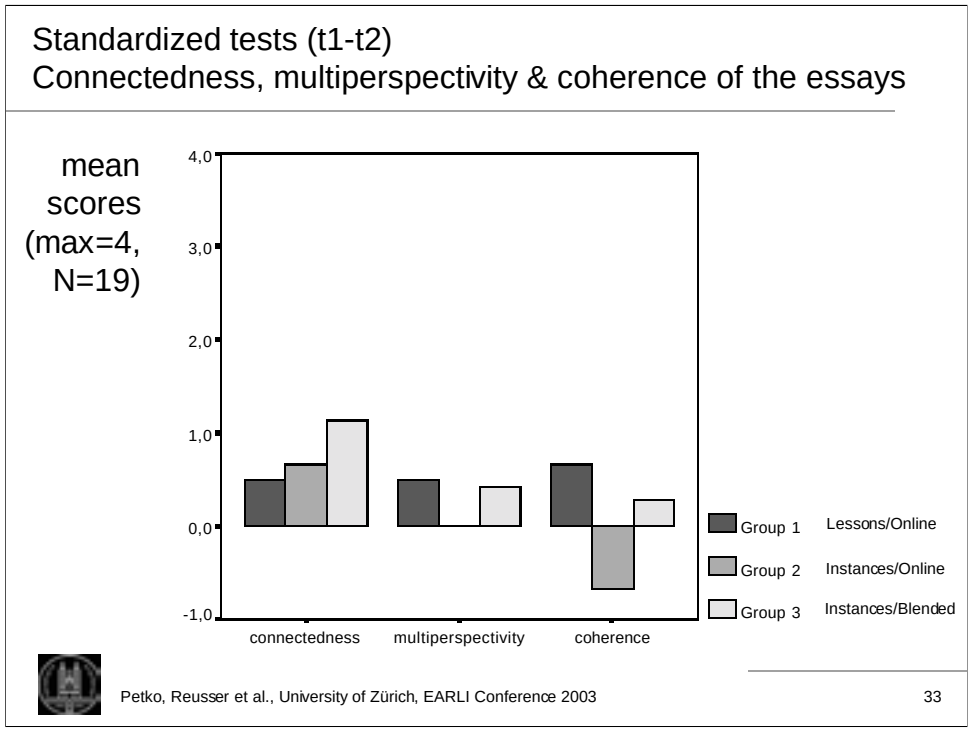


The essays of the students were rated by an expert regarding the connectedness of the single aspects of good classroom teaching, the multiperspectivity of standpoints and the coherence of the description. These are the results from the initial test.

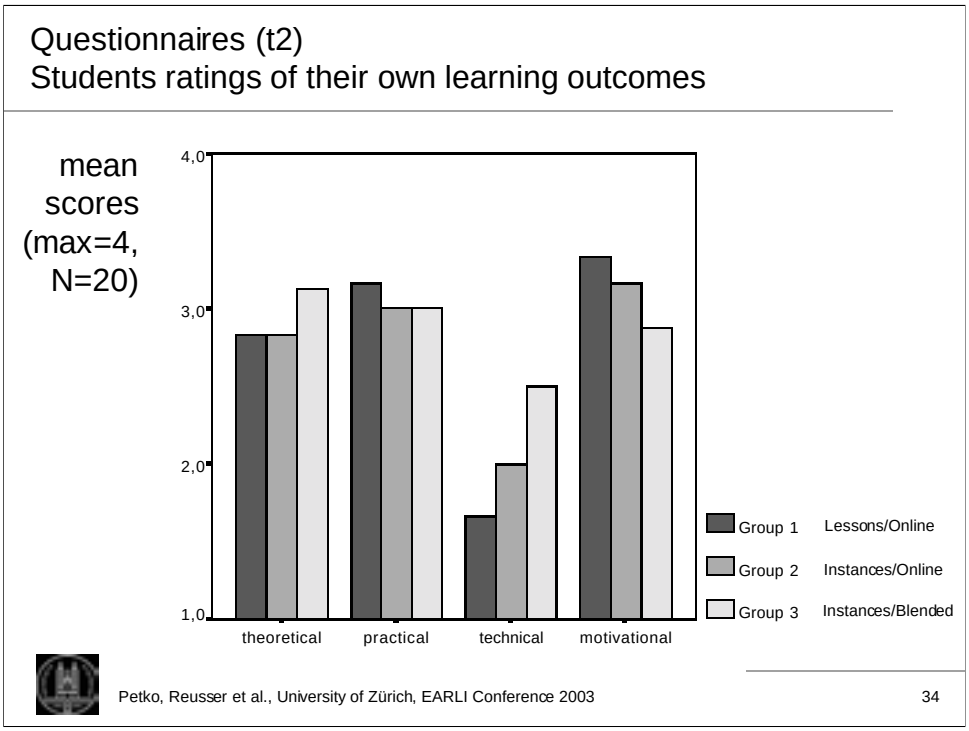


At t2 the students performbetter. Aspects of good classroom teaching are more interconnected, consider a higher degree of multiple perspectives and are, in part, more coherent. Differences between the three cases were small. Only coherence is lower in group three.

The differences from t1 to t2 are shown in the next slide.



As you can see there is a mean loss of coherence in the second essay of group 2.

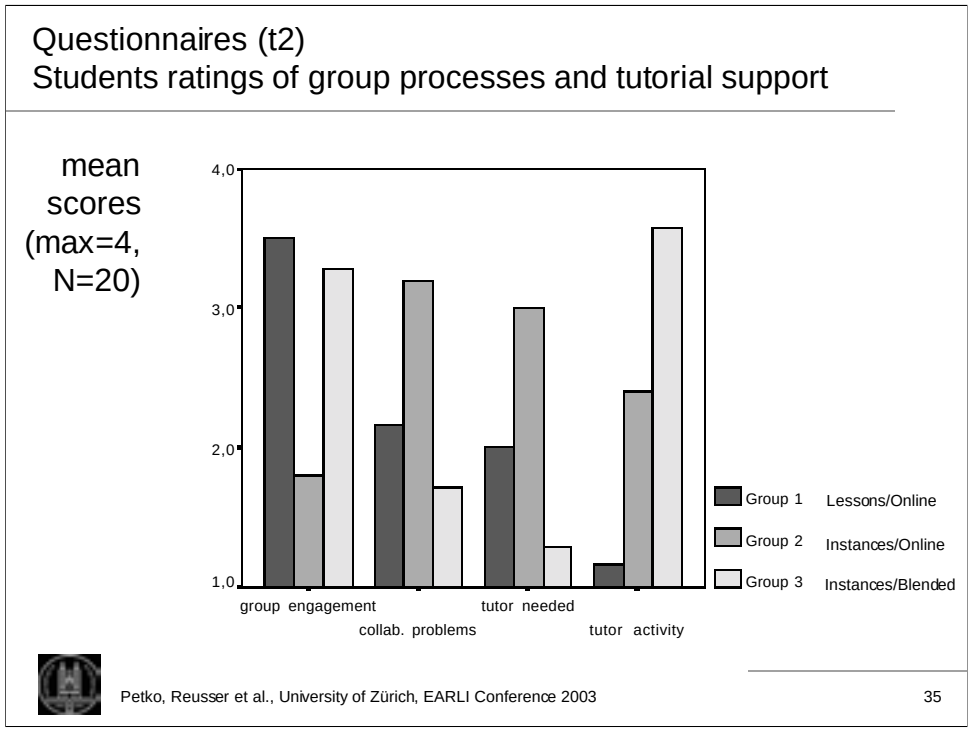


After the four weeks of using lessonlab viewer, we asked the students to estimate their learning outcomes.

As we can see on the chart the judgement of the students are consistently quite high (around 3.0 on a 4-point scale). We have high ratings on the gain of theoretical and practical knowledge. Students ratings on motivational impact are even higher.

Technical knowledge gain is much lower. This can be interpreted in a way that it is not very difficult to use Lessonviewer.

Q 60, 61, 64, 67



On the process level there are some clear differences between the three groups. Group 2 had more difficulties to establish a productive learning collaboration and tutorial support was needed to a higher extend.

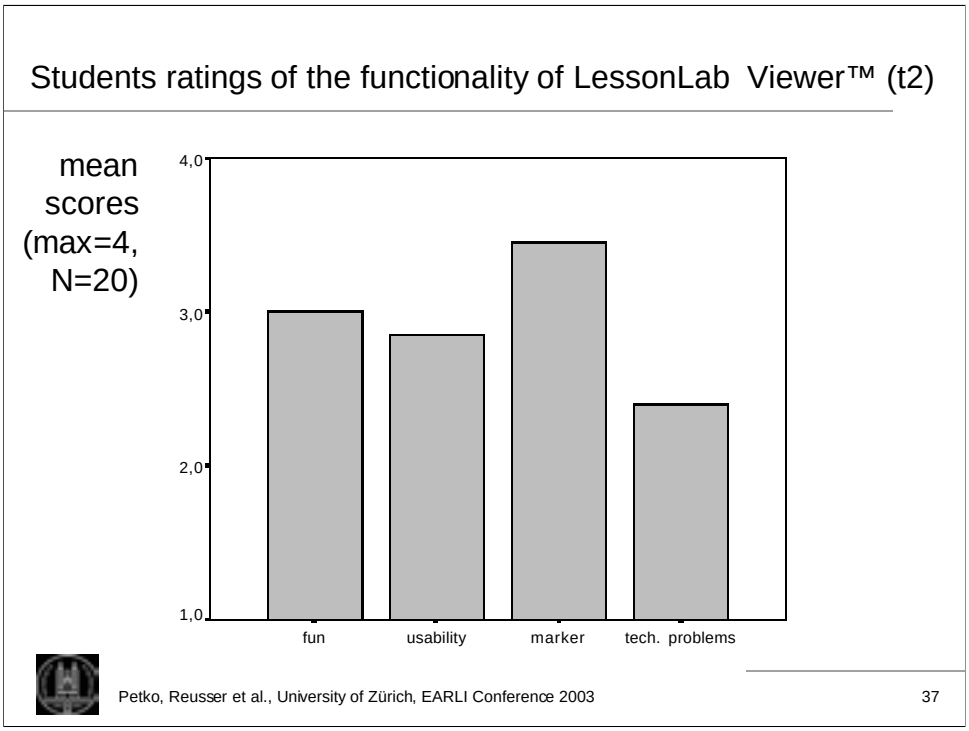
Actually the tutor was most active in Group 3. In Group 2 the tutor participated on a medium level. And in Group 1 the students said that the tutor participated rarely.

Q 72, 44, 52, 51

Qualitative group interviews (t2)
Judgements on theory integration and group processes

- Group 1(comprehensive discussion of entire lessons/online)
  - Comprehensive theory integration
  - Good group collaboration
- Group 2 (focused discussion of single instances/online)
  - Further theory integration desired
  - Group collaboration problems
- Group 3 (focused discussion of single instances/face to face)
  - Further theory integration desired (though highly motivated)
  - Group collaboration strongly led by tutor (no problem)

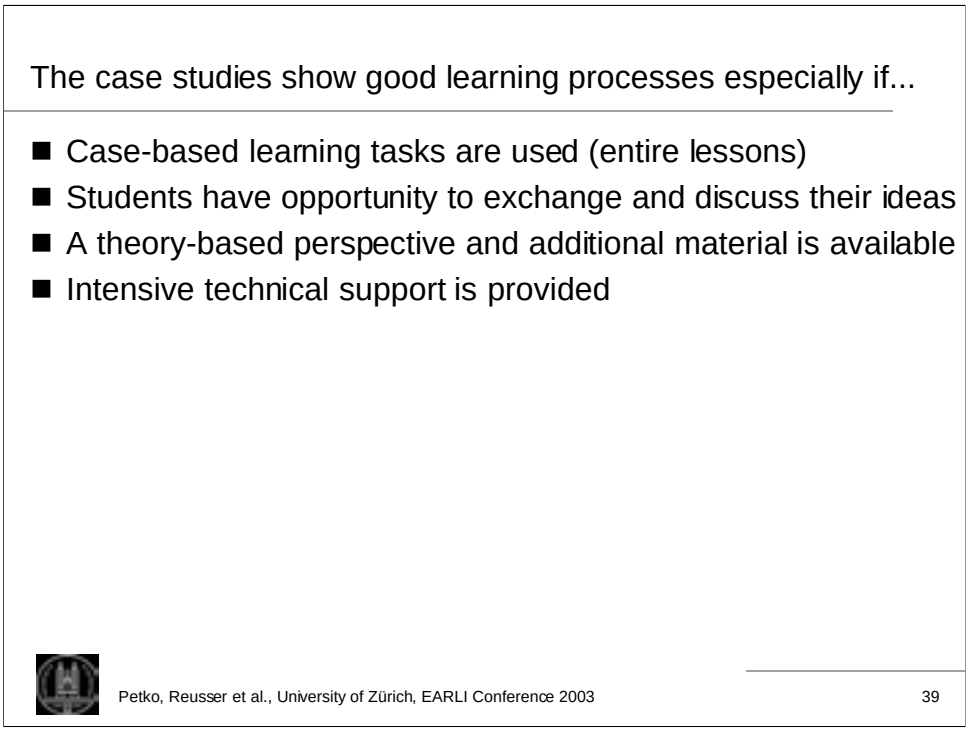
The quantitative results are supported by the results of the qualitative group interviews. The students highlight the importance of group collaboration.



Students ratings show that working with LessonLab Viewer seems to be fun and the usability is rated quite high. Especially the marker function seems to be very useful in the eye of the students. But, as you can see, there are still some technical problems (we managed that with intensive technical support).

Q 79, 80, 81, 83

5. Final remarks based on our exploratory case studies



We can not show a difference between the groups in the impact of the task structure on learning outcomes. But it is evident that the learning processes in the three cases turned out to be very different.

The case studies point to certain hypotheses. These assumptions are not proved and has to be examined by futher research on this topic.

Overall findings show, that learning can be promoted using this approach and that the software has proven to be useful and stable.

Fields of application

- All fields of practice where complex, observable (inter-)action is performed, e.g.

- Counseling
- Education
- Engineering
- Medicine
- Law

Finally we can think of several other fields of practice where this video-centred approach can be useful...

Thank you for your attention

For further information on the tool
http://www.lessonlab.com

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