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Problem-Based Learning in Teaching of Psychology

Traditional and Distributed Approaches

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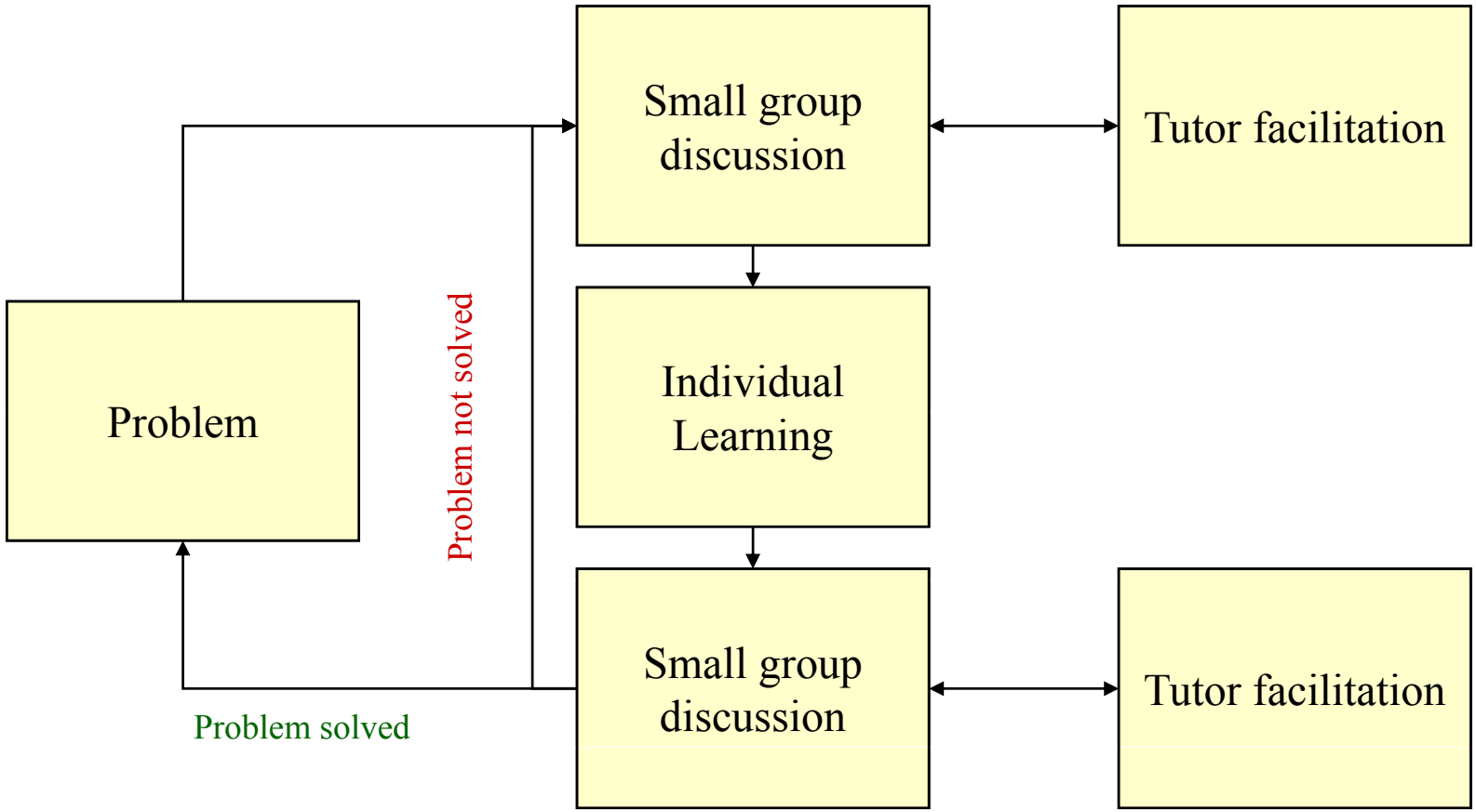
Overview

- Background: Problem-Based Learning (PBL) and distributed Problem-Based Learning (dPBL)
- Role of tutors in PBL
- Study 1:
  The role of expert and novice tutors in distributed and traditional problem-based learning
- Study 2:
  The role of *learners' expertise* in traditional problem-based learning

Background: (Distributed) Problem-Based Learning (*d*PBL)?



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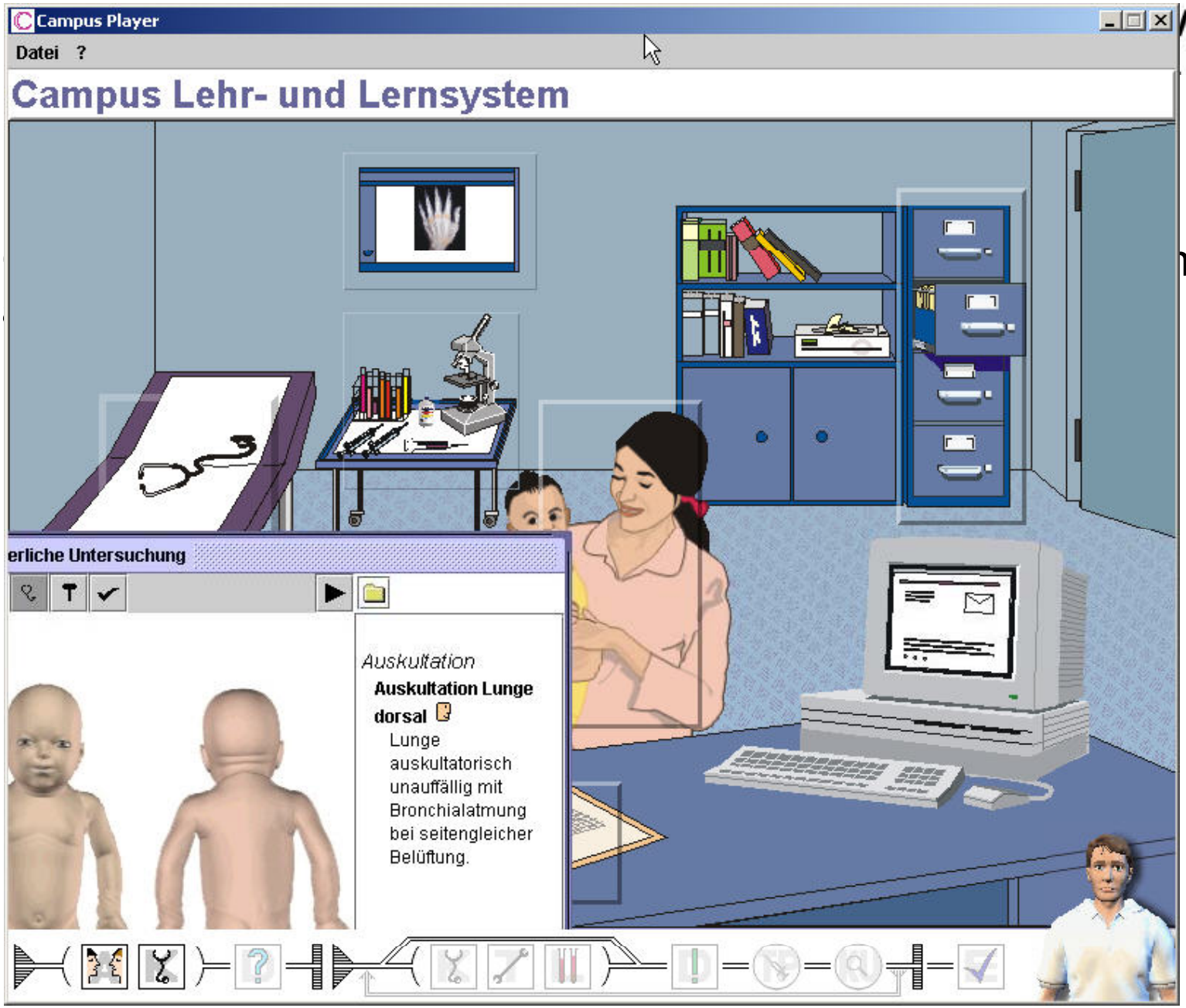
Campus Player
Datei ?
Campus Lehr- und Lernsystem
erliche Untersuchung
Auskultation
Auskultation Lunge dorsal
Lunge auskultatorisch unauffällig mit Bronchialatmung bei seitengleicher Belüftung.

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Small group learning

- Support and facilitation of social processes
- Support and facilitation of cognitive processes
- Inluences of:
  - Stable vs. less stable groups
  - Group size
- Successful task-oriented groups (McGrath, 1984):
  - Production-function
  - Group well-being
  - Member support

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Individual Learning

- Working on own objectives
- Resources:
  - Study books
  - Journals
  - Experts
  - Accompanying lectures and seminars

Tutors‘ facilitation

- Small group support as „didactic leader“
- Improving cooperative behavior
- Stimulating questions
- Not directive
- Learner centered
- Heterogeneous research outcomes regarding the tutors‘ role:
  - Expert tutor or
  - Non-expert tutor, peer or staff

Research review: Comparative research

- Lecture-Based Learning (LBL) vs PBL
- Mainly: Medical Education
  - Basic Sciences: LBL ≥ PBL
  - Clinical Sciences: PBL ≥ LBL
  - Problem-Solving: PBL > LBL
  - Self-directed learning: PBL > LBL
- Problems of comparative research :
  - Heterogeneous approaches
  - Low effect sizes
  - Testing methods not appropriate (e.g., MC-tests)

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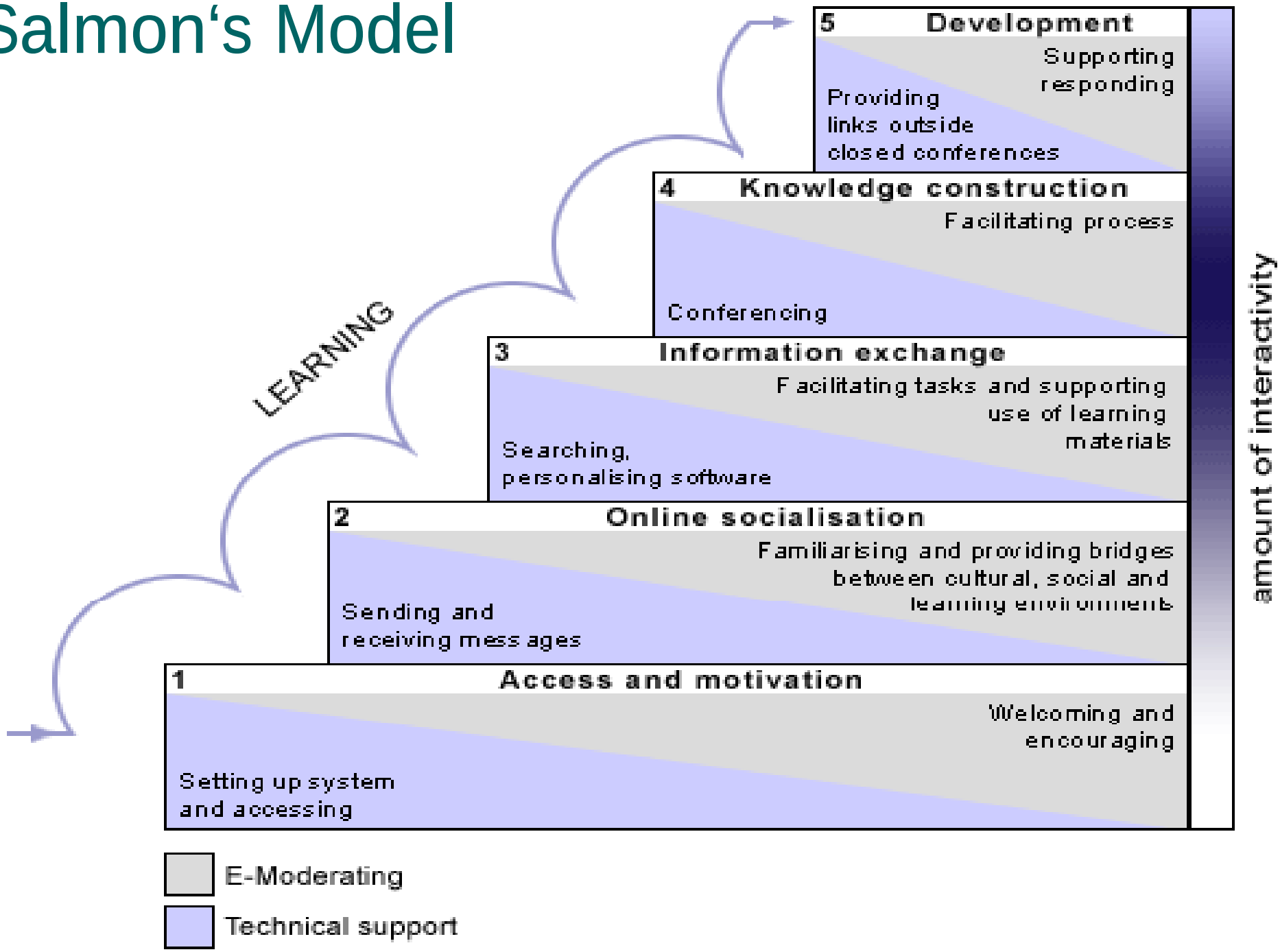
Moving from PBL toward dPBL

- Media integration has a long tradition in PBL, e.g. by means of images or video
- Advantages of dPBL
  - Equally distributed participation of students (Cameron et al., 1999)
  - Chance to respond facilitator
  - Automatic storage of a group's discourse
- Disadvantages
  - Human-Computer Interface
  - Higher drop-out rates (Thomas, 2000)
  - Technical problems (e.g. Björck, 2001)
  - Insufficient group facilitation
- **One focus in our research: What kind of influence does a change in (communication) media have on tutors' facilitation?**

Salmon‘s Model



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Study 1: The role of expert and novice tutors in distributed and traditional problem-based learning in novice learners

- Influence of tutor behavior on learners during PBL and dPBL?
  - Expert tutors versus
  - Moderating non-expert tutors
- Role of communication media?
  - Face-to-face versus
  - Synchronous computer-mediated communication
- Interaction effects?
- Material: A case description of a woman with a co-morbid disorder (Anorexia Nervosa and Depression) & Learning Material online (text book chapters)

Method & Design

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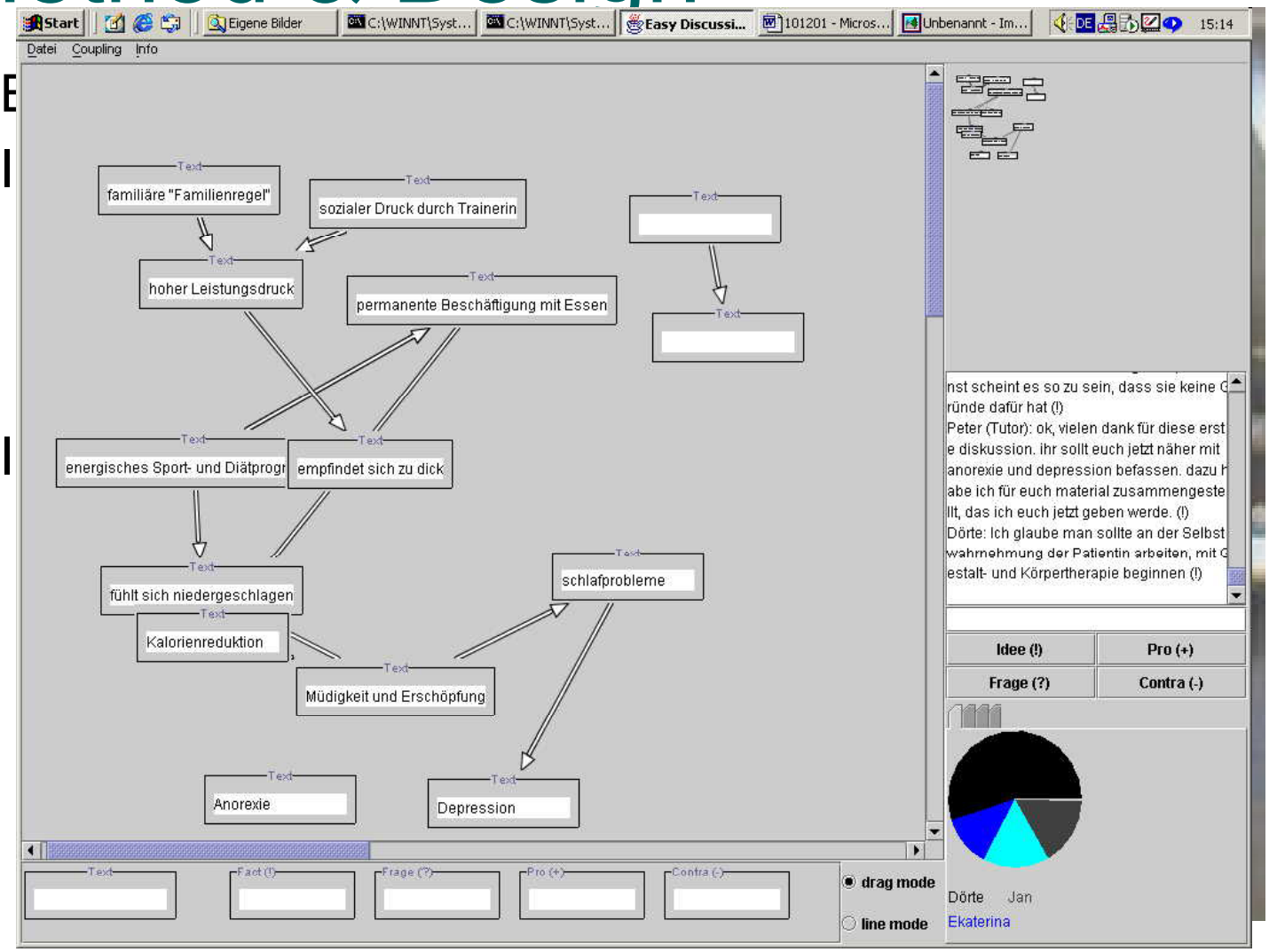

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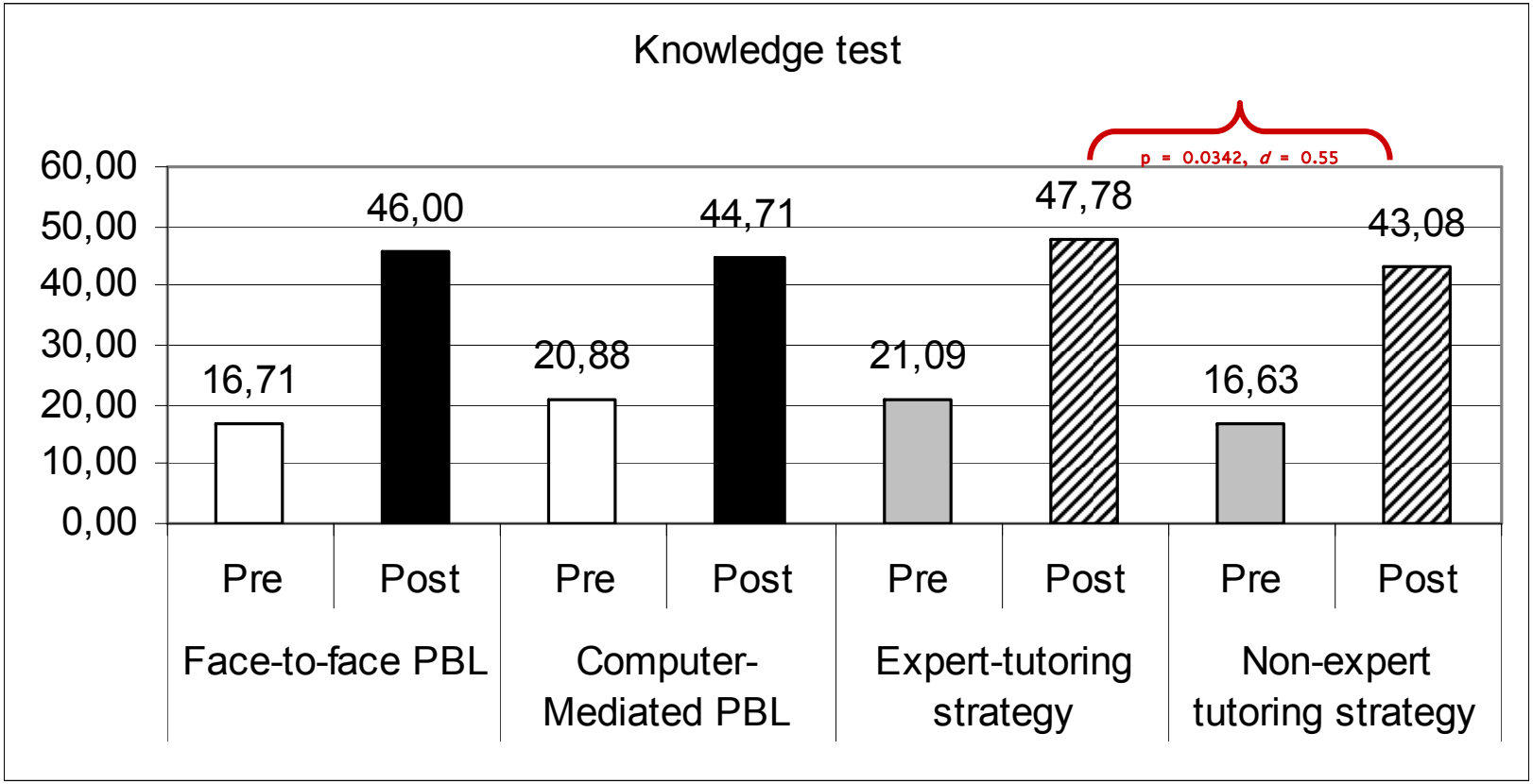
Dependent variables

- Cognitive: Knowledge tests (Concept Mapping & MC)
- Meta cognitive: Certainty about own knowledge
- Motivation
- Emotional attribution: Satisfaction and course evaluation

Results: Knowledge



All groups performed better in the post-test than in the pre-test

(Wilcoxon Matched Pairs Test: $Z = 6.03$, $p < 0.001$, $d = 1.64$)

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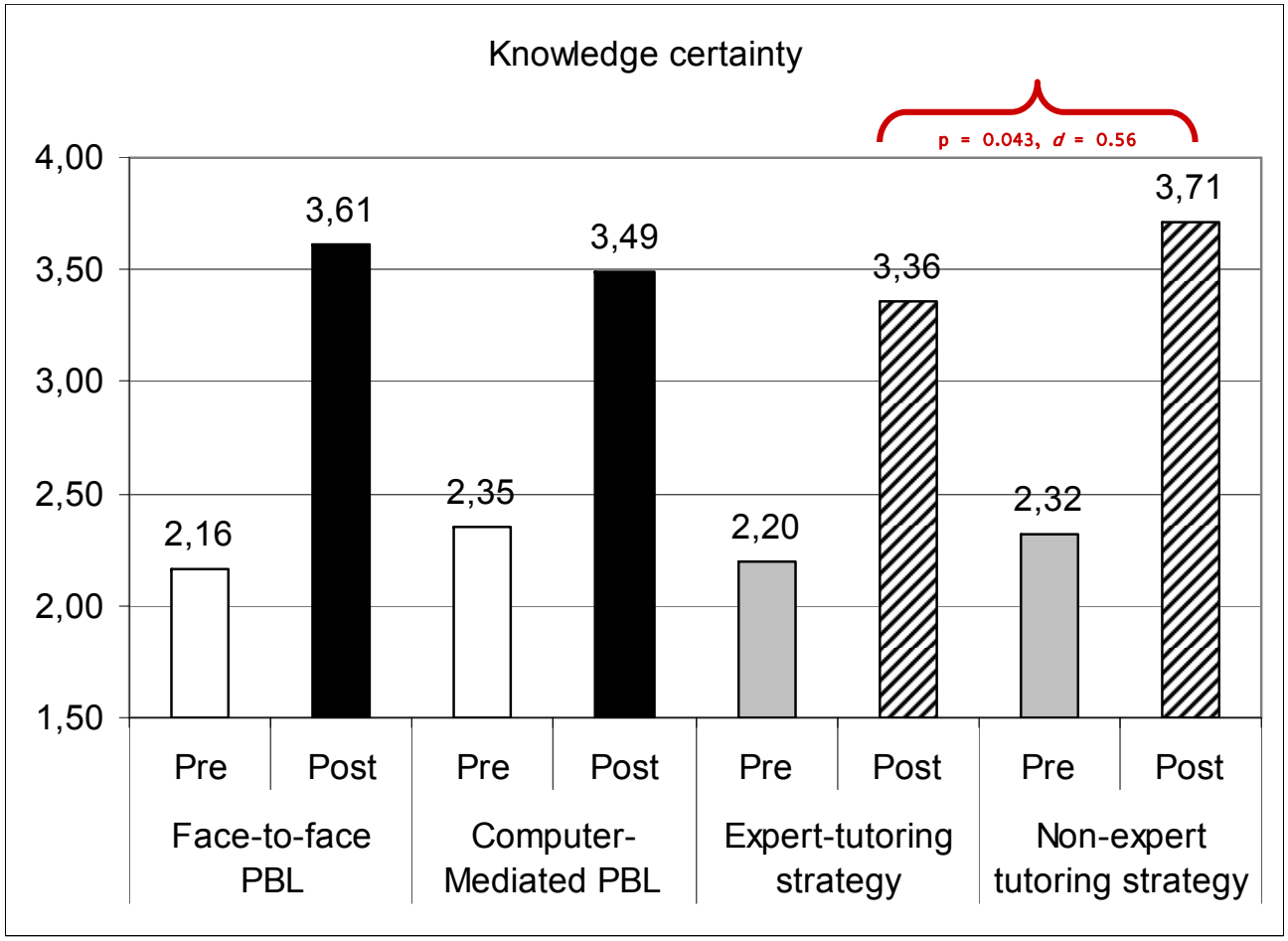
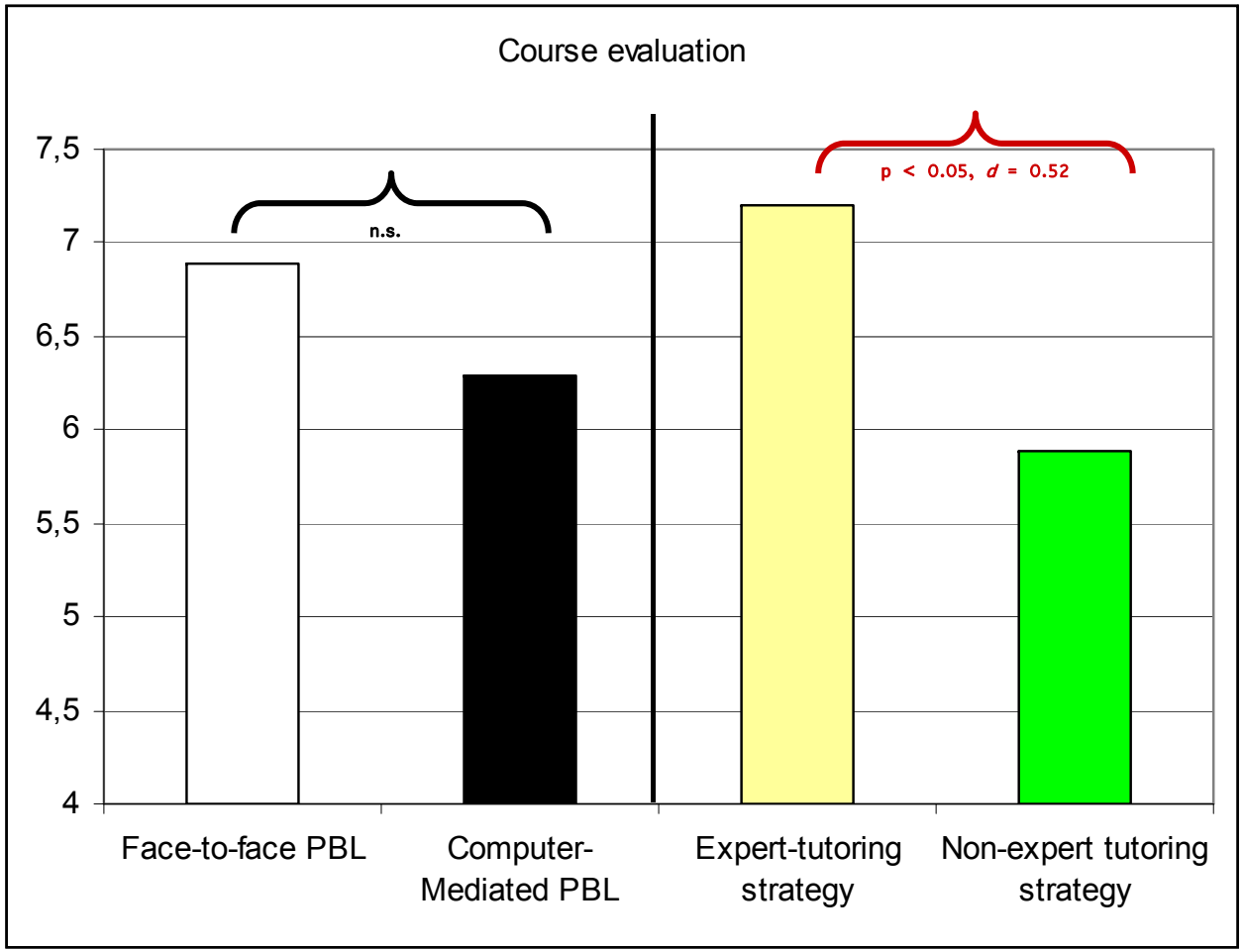
Results: Certainty



Course evaluation



Study 2: The role of learners‘ expertise

- Quasi-experimental
- Independent variable: Tutor behavior
  - Expert tutor: Completion of information & correction of wrong statements
  - Moderation
- Independent variable: Learners’ expertise (practitioners vs. students)

	Expert tutor	Moderating tutor
Beginners	N = 12	N = 12
Advanced	N = 12	N = 12

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Dependent variables

- Cognitive: Knowledge tests (Concept Mapping & MC)
- Meta cognitive: Certainty about own knowledge
- Motivation
- Emotional attribution: Satisfaction and course evaluation
- Material (same as in Study 1)

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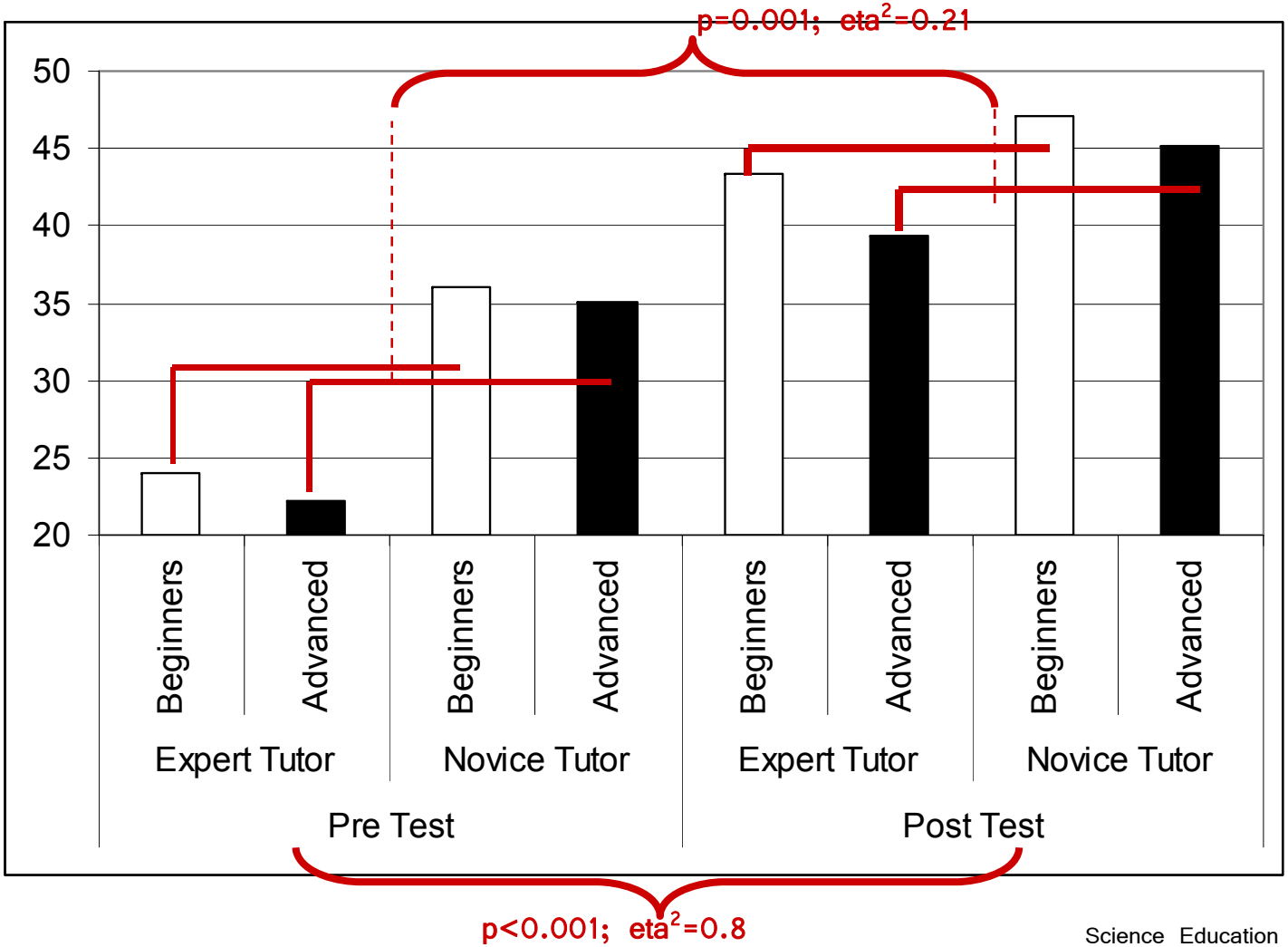
Results: Knowledge Acquisition



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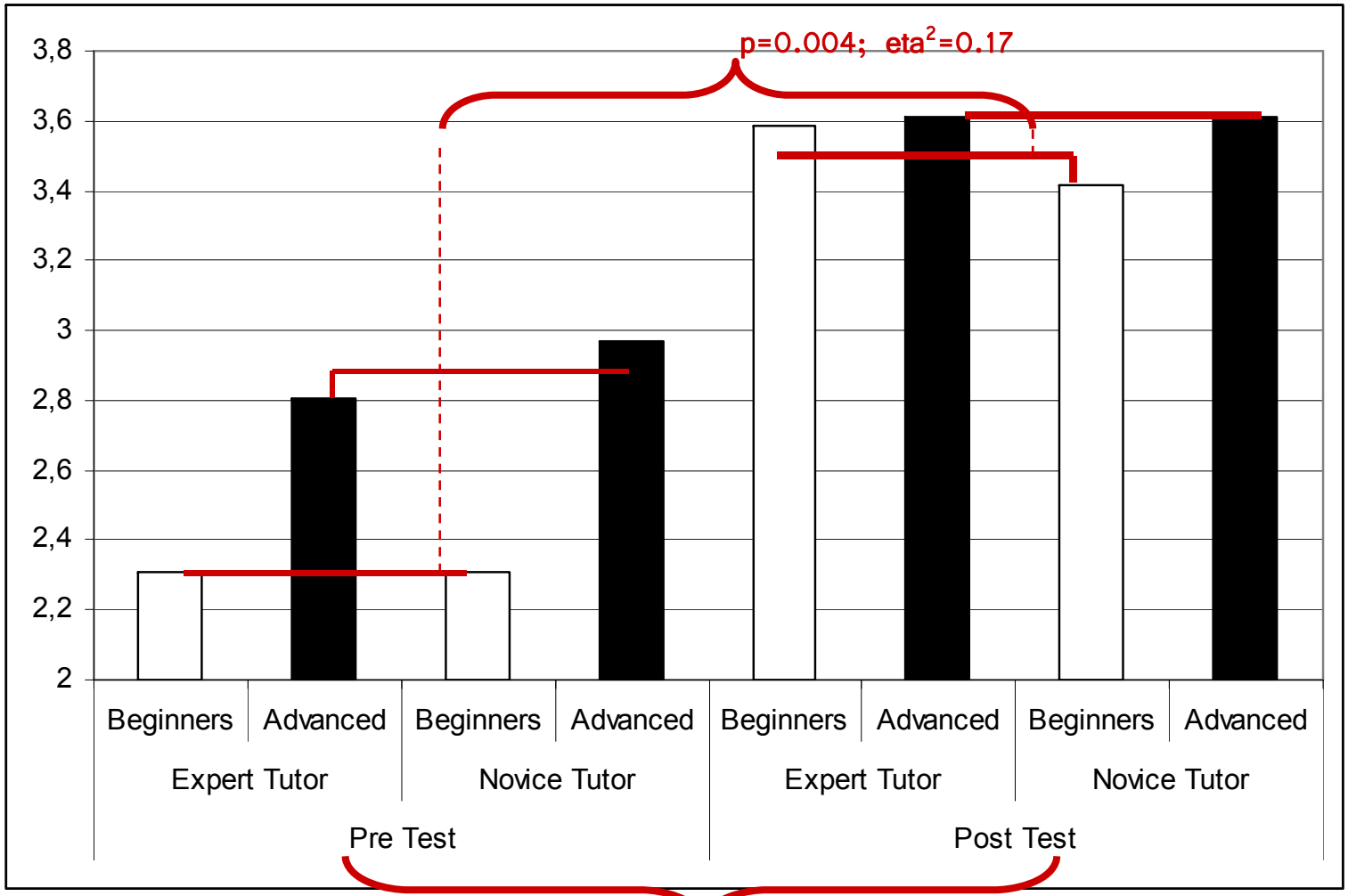
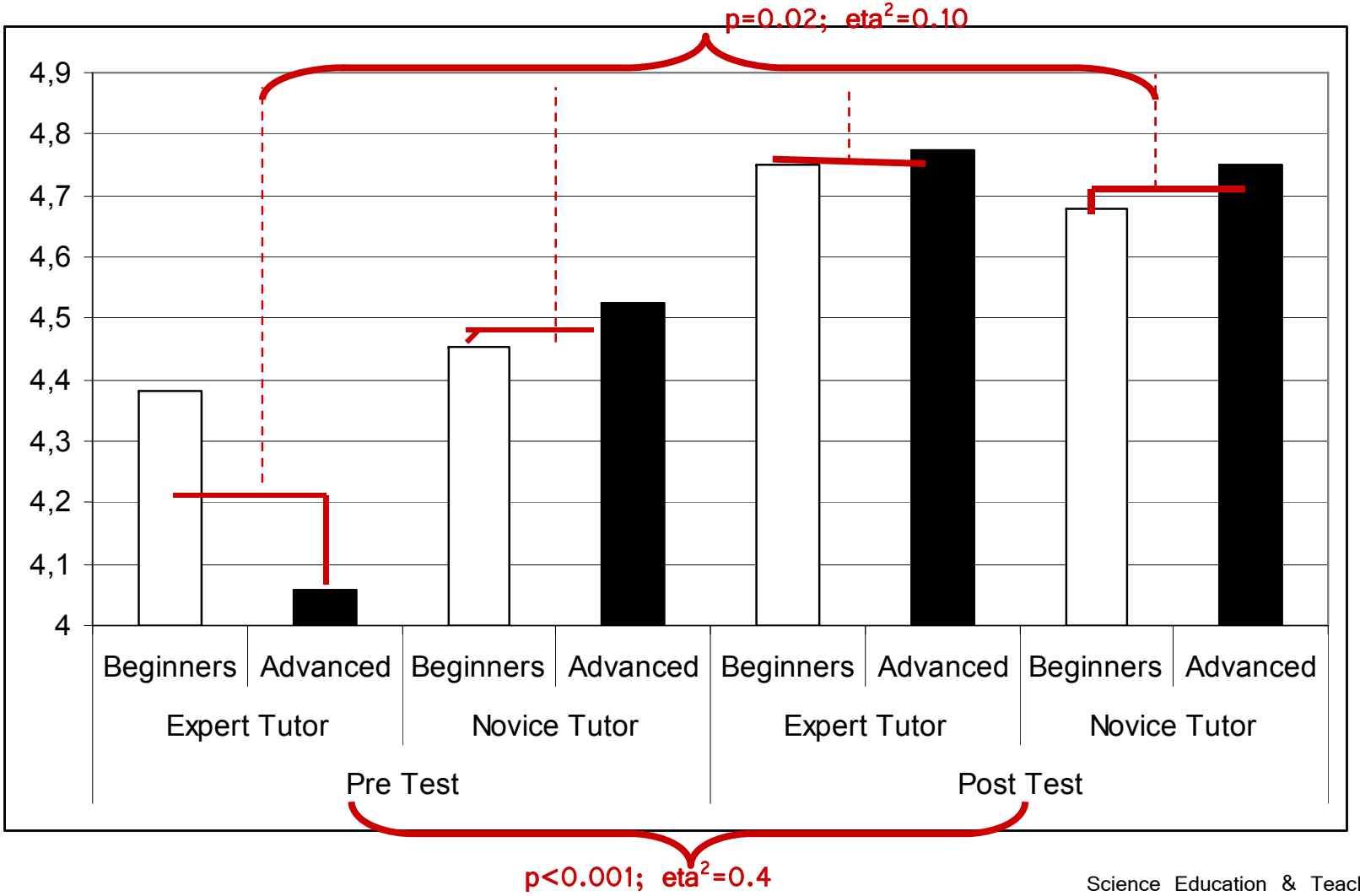
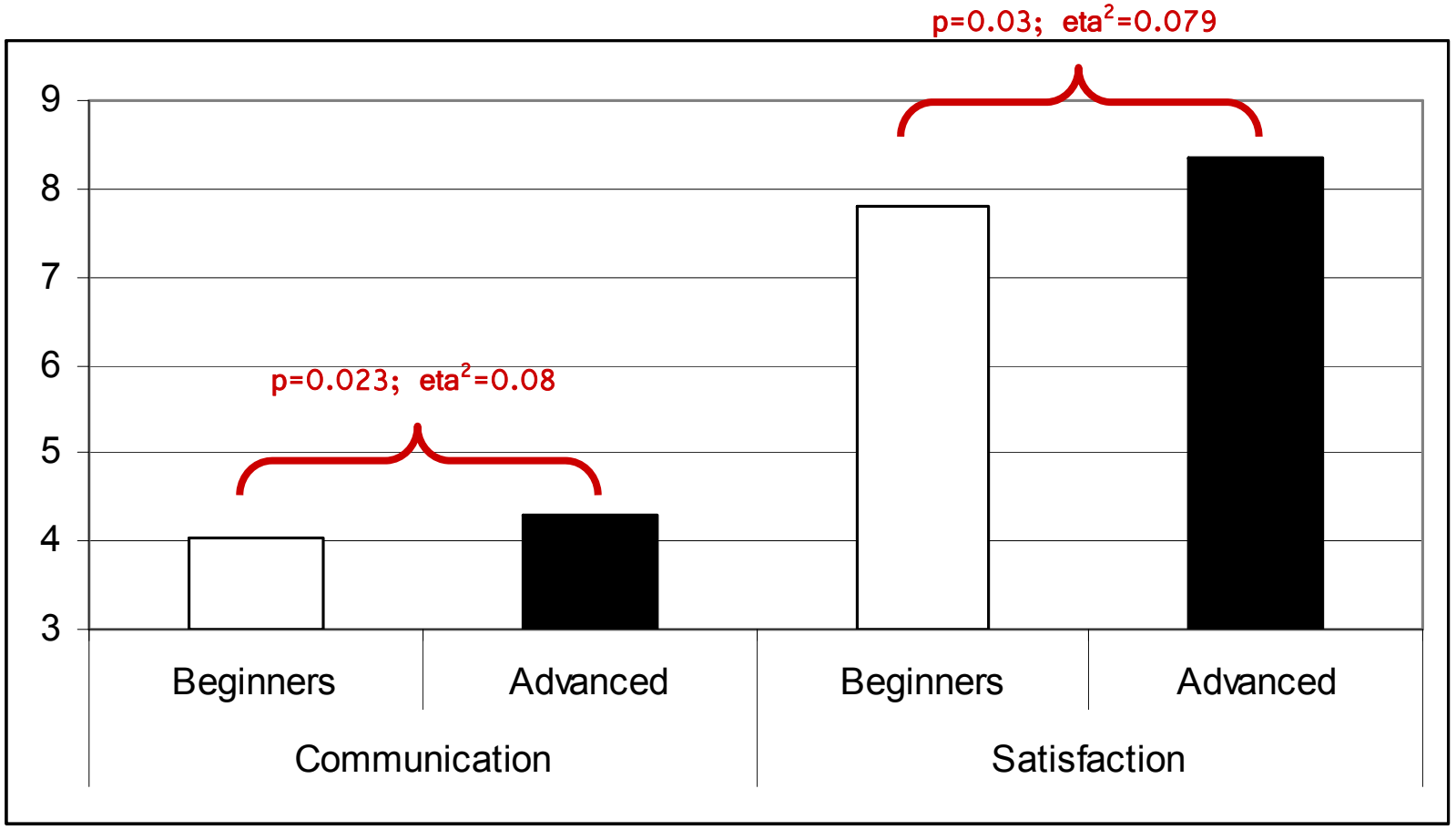
Results: Certainty in Knowledge Acquisition



Results: Motivation



Results: Communication & Satisfaction



Summary & Discussion

- Study 1:
  - In „*expert tutor condition*“ participants learn quantitatively more and are more satisfied with the learning environment
  - In „*moderator conditions*“ participants have a higher certainty about their knowledge, perhaps an “illusion of knowledge”
  - In „*dPBL condition*“ facilitation of the group is regarded as more important; satisfaction with the small group work is smaller
  - Note: All participant were beginners in PBL and in the content of the lesson
  - This stands in line with prior PBL field research: Beginners need a higher level of guidance/instruction

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Summary & Discussion

- Study 2:
  - Novice Learners are highly “vulnerable” for intervention (here: knowledge acquisition and motivation)
  - In *„moderator condition“ (i.e., with a non-expert tutor)* participants still have a higher certainty about their knowledge, again an “illusion of knowledge”?
  - Novice learners seem to need more guidance while expert learners seem to benefit from self-directed PBL
  - This stands - again - in line with prior PBL field research: Beginners need a higher level of guidance/instruction

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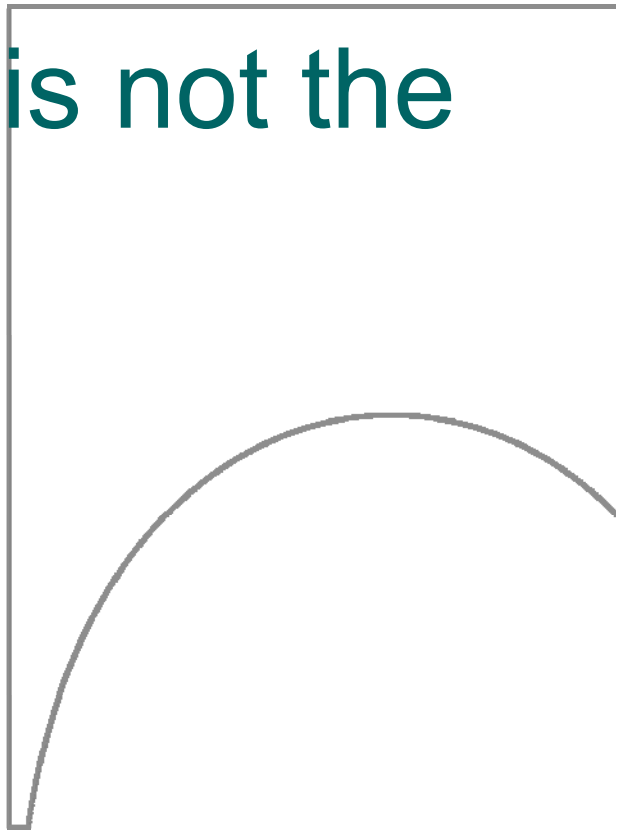
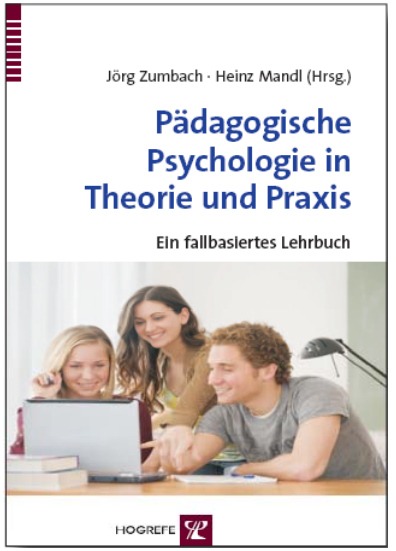
Study 3: When the case is not the problem…

…but the class size ;-(



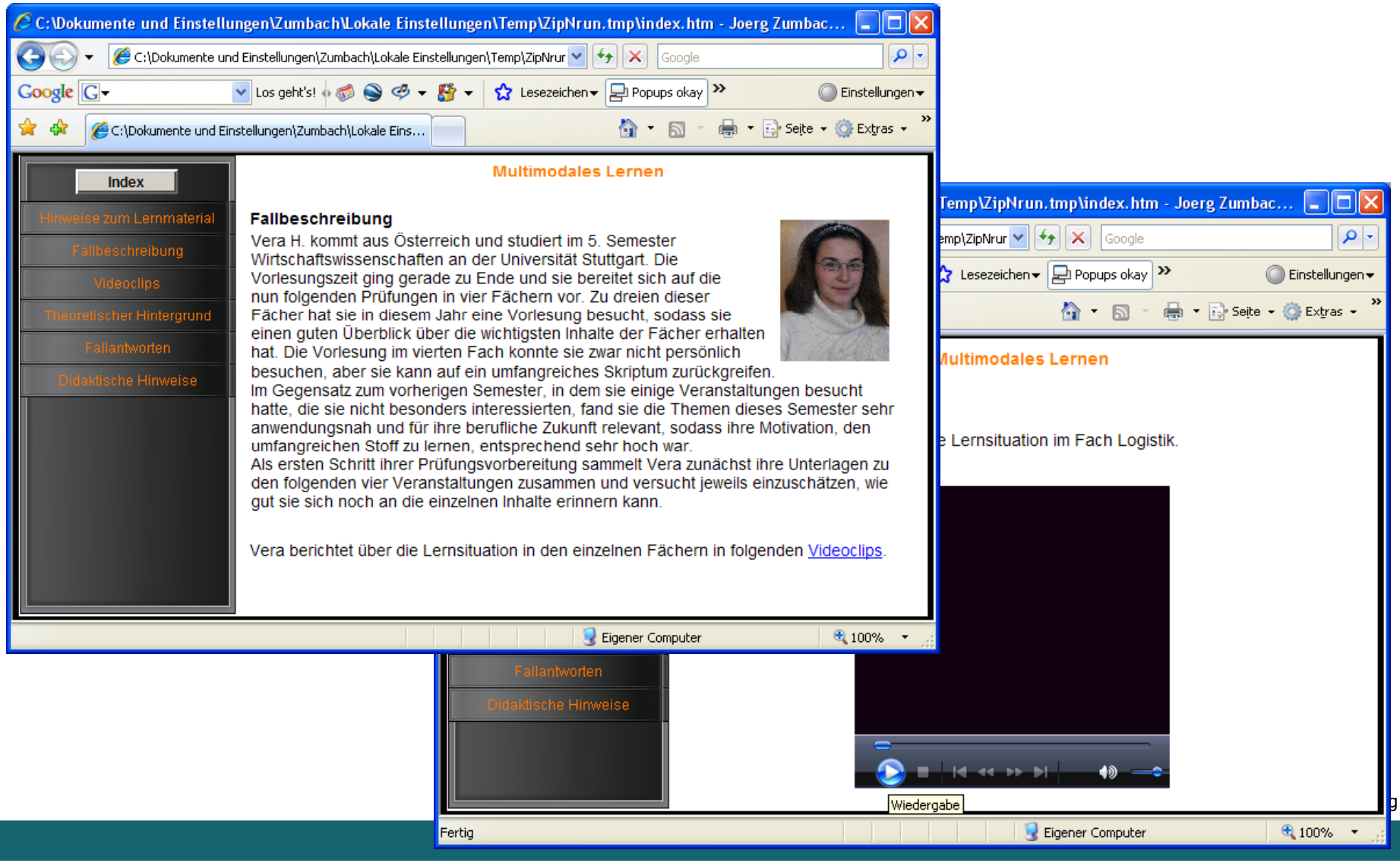
Case-based Teaching in Large Lectures

- Text from a case-based study book
  - Cases
  - Questions to approach the case
  - Theoretical background
  - Relation theory - case
  - Answers to the questions

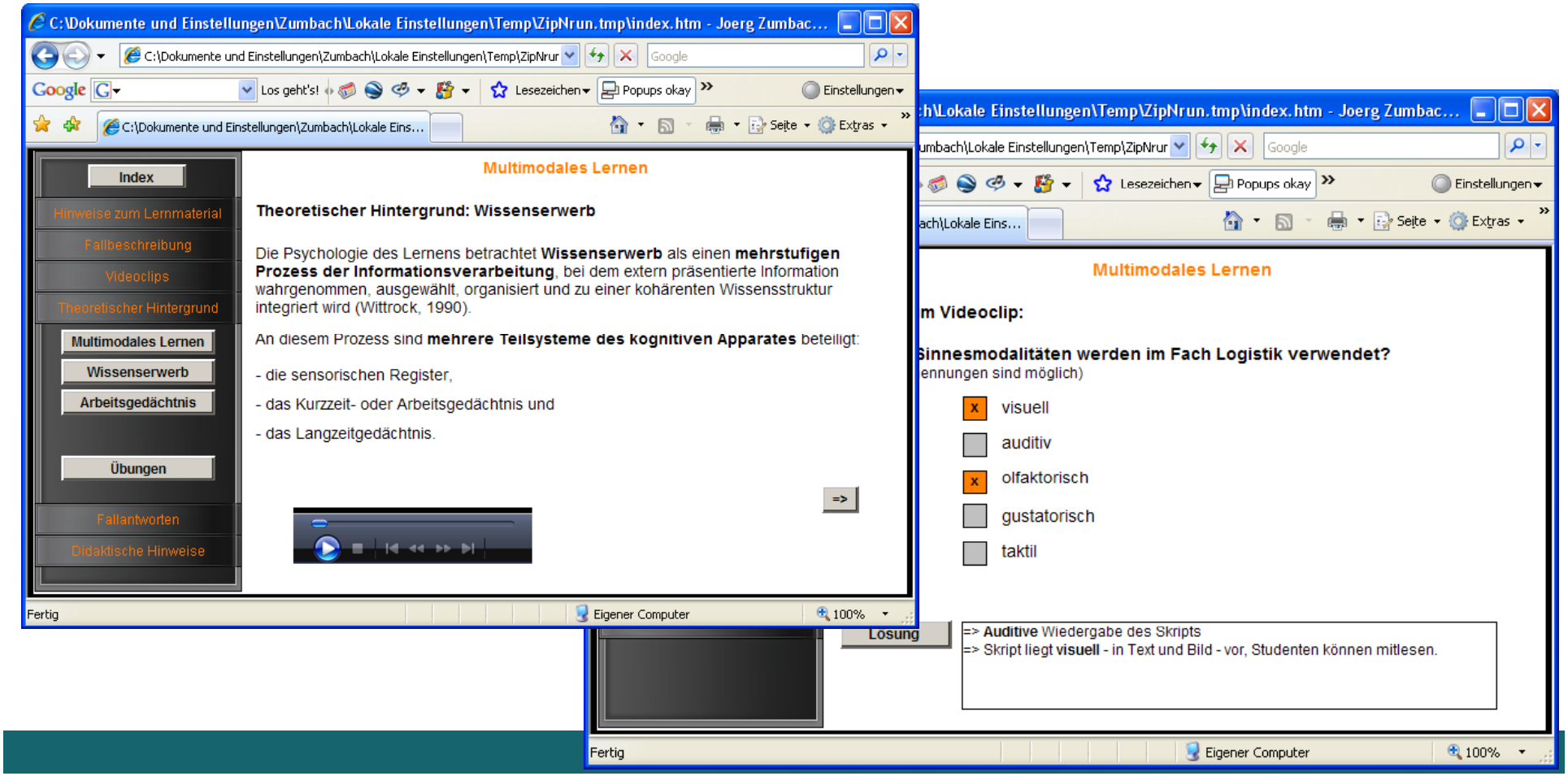


- Implementation in a digital learning environment
- Dual use: In lecture and as self-regulated LE

Video-based Format



Theoretical background and solutions



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Comparison with a common lecture

- Skales:
  - Teaching quality (13 Items; Cronbach‘s Alpha = 0.82)
  - Probability of transfer (5 Items; CA = 0.69)
  - Motivation (7 Items; CA = 0.89)
  - Knowledge acquisition
  - Subjective certainty in knowledge acquisition
  - Overall judgment
- Baseline and case-based lecture (complete data N = 43)

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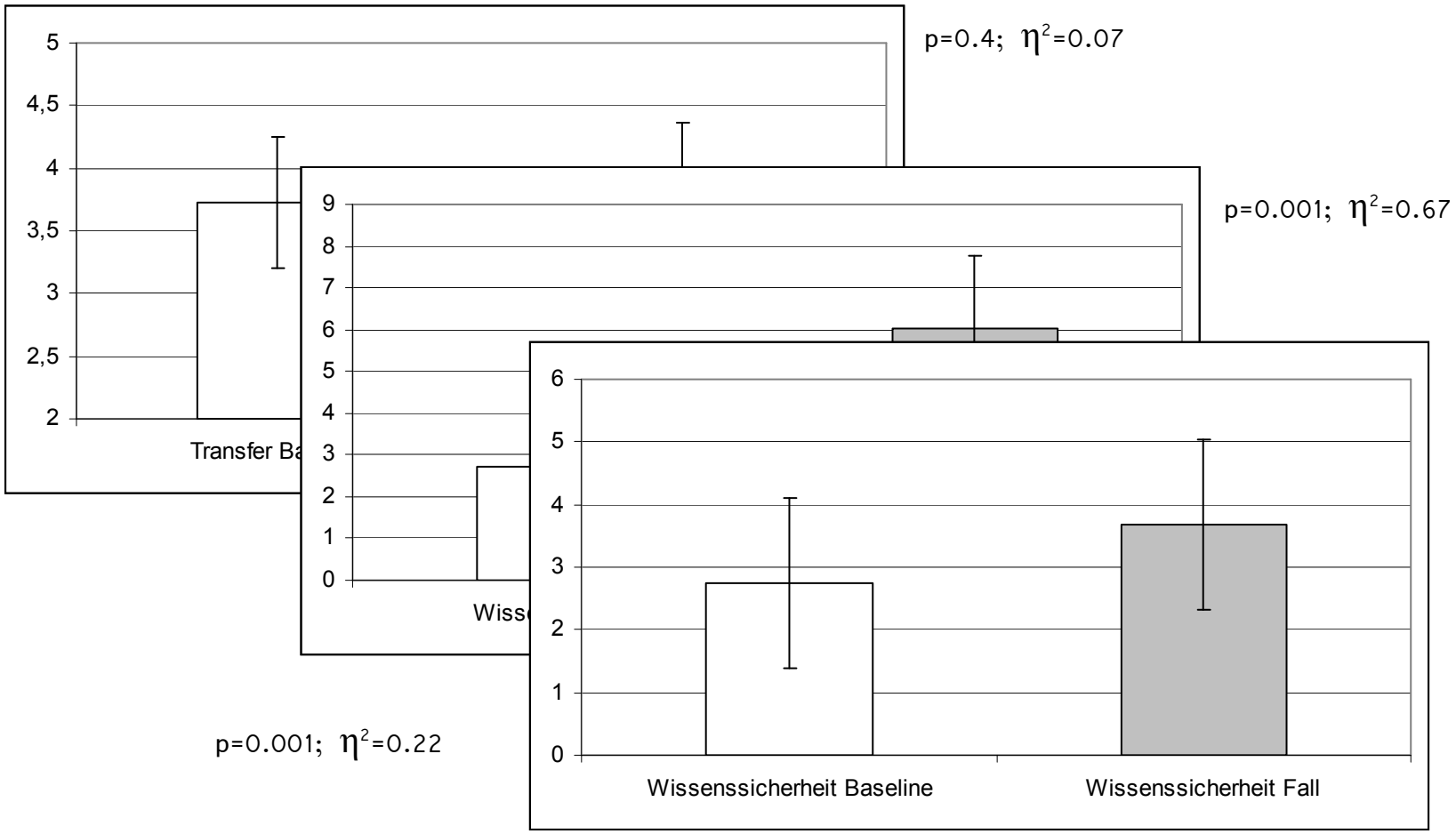
Results

- No significant differences in :
  - Quality of teaching
  - Motivation
  - Overall judgment
- Significant increase from baseline to case-based teaching:
  - Transfer
  - Knowledge acquisition
  - Subjective certainty in knowledge acquisition

Results


p=0.4; η²=0.07
p=0.001; η²=0.67
p=0.001; η²=0.22
Wissenssicherheit Baseline
Wissenssicherheit Fall

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Summary and discussion

- Learning with cases/problems in large lectures
  - Does not necessarily motivate students more
  - Does not change the prerequisites of large lectures and students‘ overall judgments
- But:
  - Strengthens the subjective practical relevance and probability of transfer
  - Is an effective instructional approach
  - Fosters students self competence
- Might be a pragmatic and intermediate approach to PBL

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Österreich wie es weint und lacht…

…außer Hochdeutsch

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