EFFECTS OF PEER-TUTOR COMPETENCES ON LEARNER COGNITIVE LOAD AND LEARNING PERFORMANCE DURING KNOWLEDGE SHARING

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• Peer support
  – How to select suitable tutors?
  – How to facilitate the knowledge sharing process?
Key words of this study

• Complex tasks
• Cognitive load
• Knowledge sharing
• Tutor competences
Task complexity: Simple vs. Complex

Task complexity is determined by **interactivity** of multiple information elements (Sweller, 2006).

Two essay examples:

- Please describe **men’s** preferences in partner selection and marriage forms.

- (Our task) Please compare and contrast **men’s** and **women’s** preferences in partner selection and marriage forms.

Complex tasks -> Knowledge sharing

• A **tutee** who works on a complex task needs knowledge sharing with a **tutor** who provides help.

• Knowledge sharing with a **tutor** is likely to alleviate tutee cognitive load imposed by complex tasks because
  – the tutee can acquire **extra cognitive resources** from the tutor (e.g., factual or procedural knowledge).
  – the tutor can stimulate the tutee to perform **higher-order cognitive processing** (e.g., asking think-provoking questions).

✓ Whether knowledge sharing can achieve these depends on **tutor competences**.
Research questions of this pilot

• Which **tutor competences** can alleviate tutee cognitive load and promote better learning performance?

• What are the effects of **supporting** tutors (IV) to have certain competences on tutee cognitive load (DV1) and learning performance (DV2)?
Literature review and our previous studies: Two tutor competences

Tutoring skills (TS)

**Pedagogical skills**
- asking and answering questions
- giving explanations

**Task processing skills**
- procedural knowledge on processing a particular task type (e.g., writing a comparison and contrast essay)

Content knowledge (CK)

**Knowledge on a particular topic**
- e.g., gender differences in partner selection, evolution theory
# Design and treatments

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<thead>
<tr>
<th>Class 1 (day 1)</th>
<th>Class 2 (Day 2)</th>
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## Treatments:
Supporting tutors to have certain competences

**TS groups**
TS tutors helped tutees by using written instructions: how to ask and answer questions and how to step-by-step process the task.

**CK groups**
CK tutors helped tutees by using supplement texts related to the task topic.
Process

Self-study (1 hour)
Students studied the course materials online.

Pre-measures
A prior knowledge test
A tutoring skills questionnaire

Peer tutoring when tutees worked on the task

Post-measures
Cognitive load
Post-test
Evaluation questionnaire of the tutoring process
## Results

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<th>TS tutees (n = 7)</th>
<th>CK tutees (n = 7)</th>
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<td>( SD )</td>
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<tr>
<td>Total cognitive load on NASA-TLX (tot: 120)</td>
<td>48.43</td>
<td>14.60</td>
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<td>Post-test (tot: 10)</td>
<td>5.57</td>
<td>1.90</td>
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<td>Essay (tot: 10)</td>
<td>6.90</td>
<td>1.27</td>
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Reflections and implications for the future study

• Chats: only 2 TS tutors and 5 CK tutors actually used the treatments.
• A prior training is necessary as suggested by peer tutoring studies.
• The task is not complex enough: students might have acquire internal scripts of comparison and contrast essays.