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

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Learning Networks

- 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

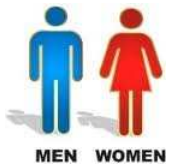
Task complexity: Simple vs. Complex

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.



Source of the photos: http://www.123rf.com/photo_6084549_men-and-women-icons-graphic-elements-set.html

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

Class 1 (day 1)				Class 2 (Day 2)			
TS		CK		TS		CK	
Tutors	Tutees	Tutors	Tutees	Tutors	Tutees	Tutors	Tutees

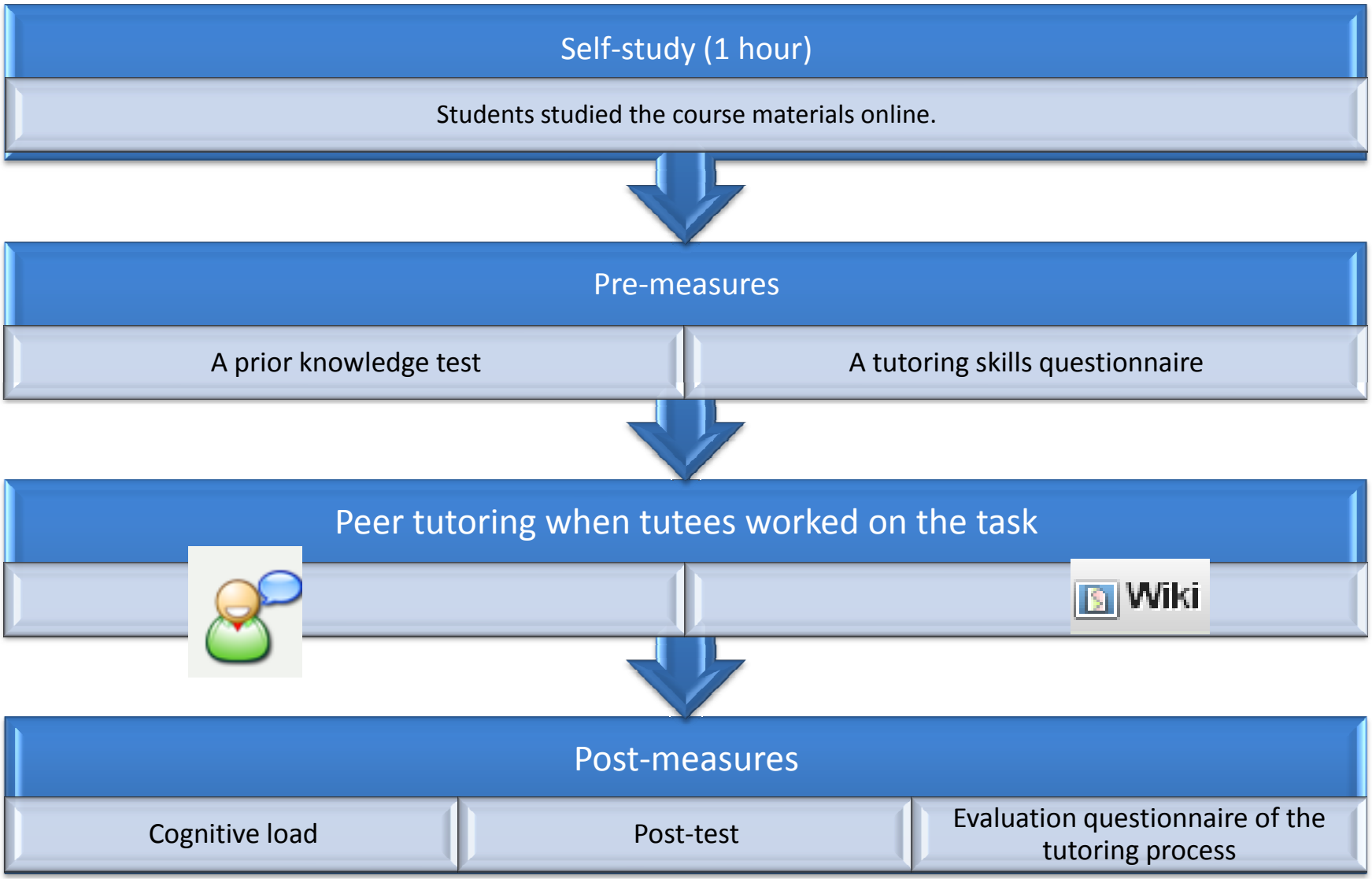
Treatments:

Supporting tutors to have certain competences

TS groups
TS tutors helped tutees by using written instructions: how to ask and answer questions & 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
Wiki
Post-measures
Cognitive load
Post-test
Evaluation questionnaire of the tutoring process

Results

	TS tutees (n = 7)		CK tutees (n = 7)	
	M	*SD*	*M*	*SD*
Total cognitive load on NASA-TLX (tot: 120)	48.43	14.60	62.07	20.01
Post-test (tot: 10)	5.57	1.90	4.57	1.27
Essay (tot: 10)	6.90	1.27	6.72	1.46

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.