

Effects of enhancing tutors with two competences on tutees' cognitive load and task performance

Citation for published version (APA):

Hsiao, A., Brouns, F., & Sloep, P. (2013). *Effects of enhancing tutors with two competences on tutees' cognitive load and task performance*.

Document status and date:

Published: 05/09/2013

Document Version:

Peer reviewed version

Document license:

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Effects of **enhancing** peer tutors with two competences on students' **cognitive load** and **task performance**



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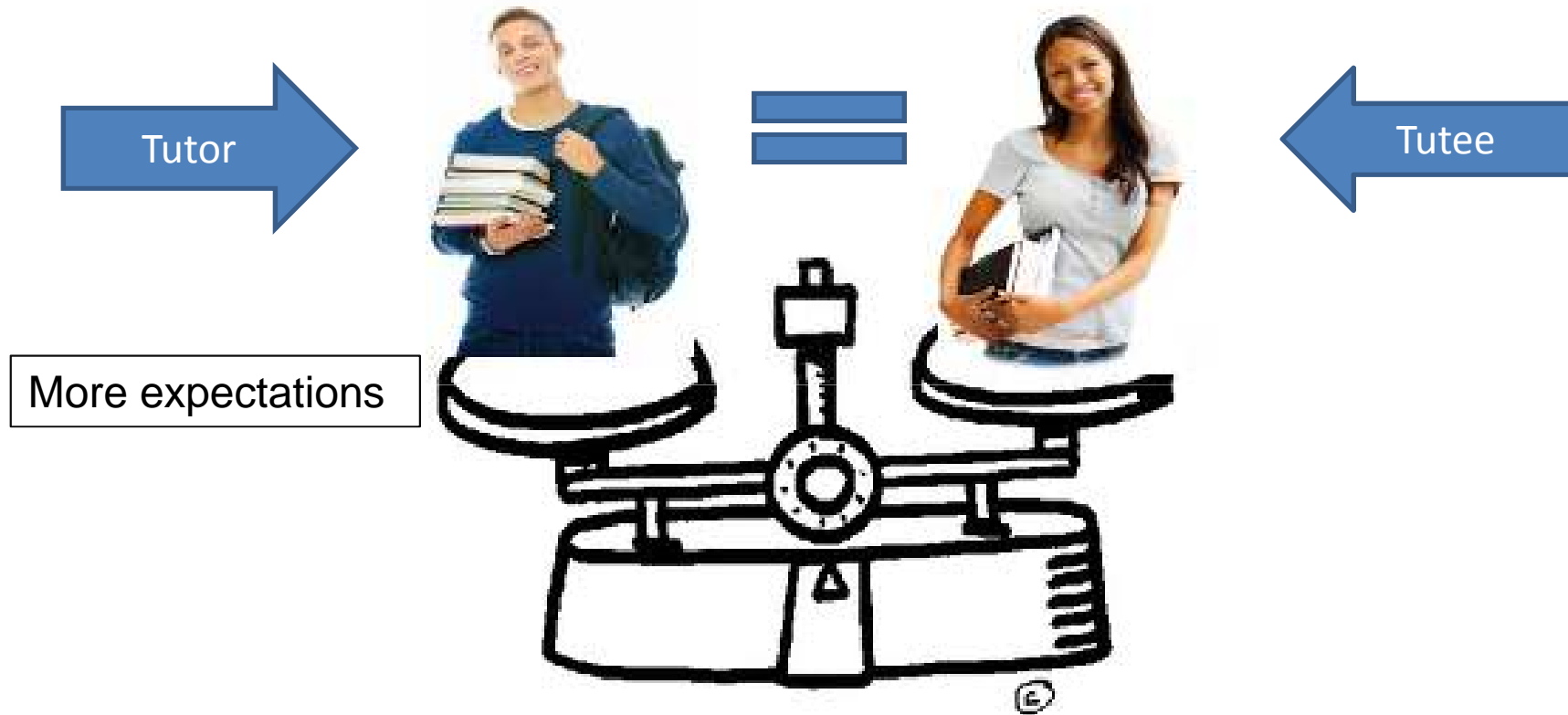


EARLI 2013

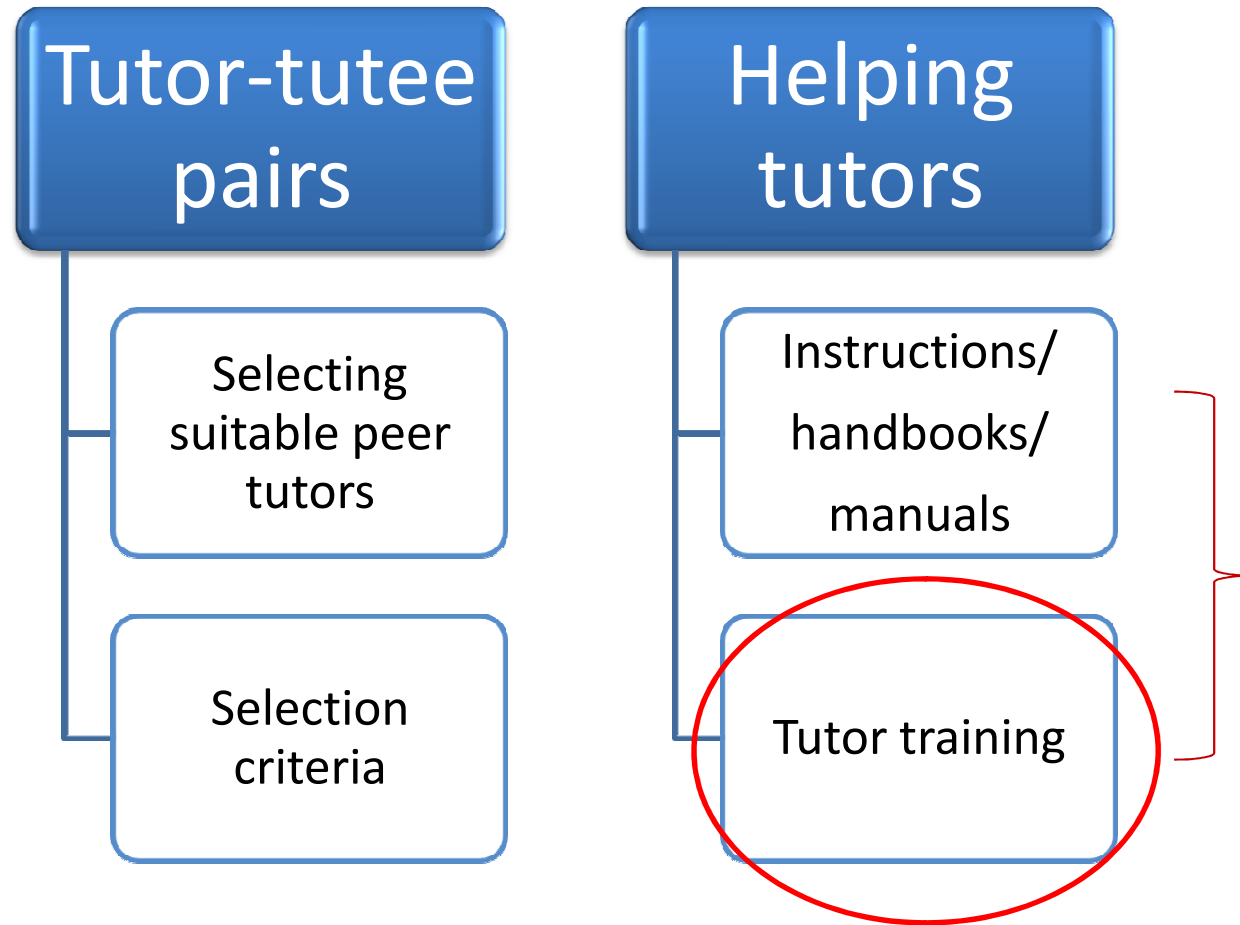
27-31 August, Munich, Germany



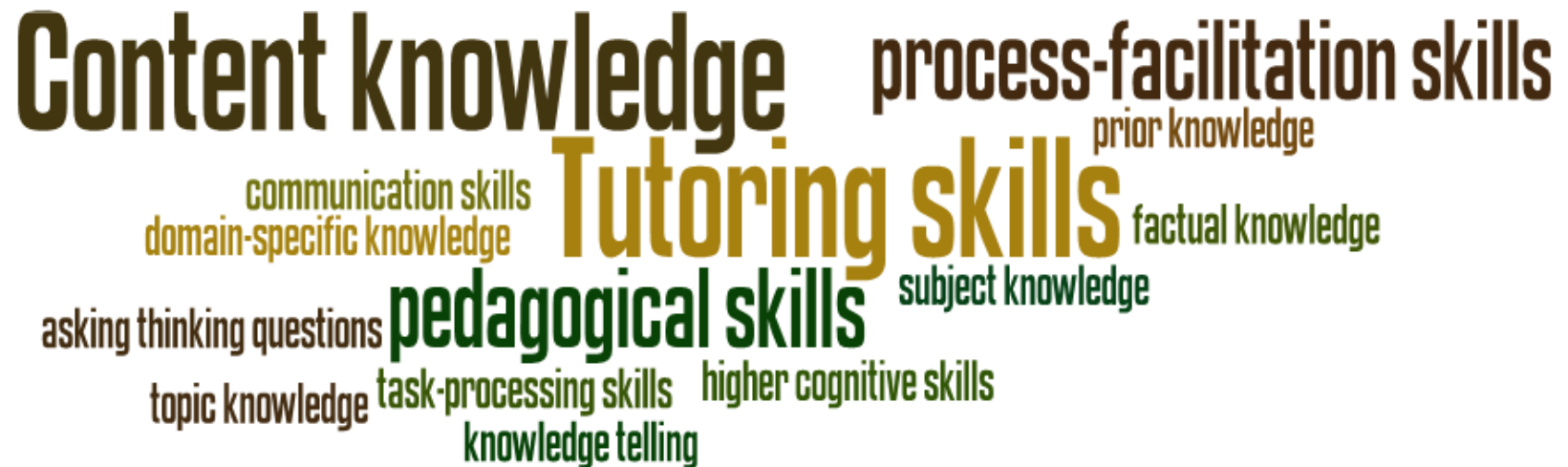
What is peer tutoring?



My project: How to support peer tutoring?

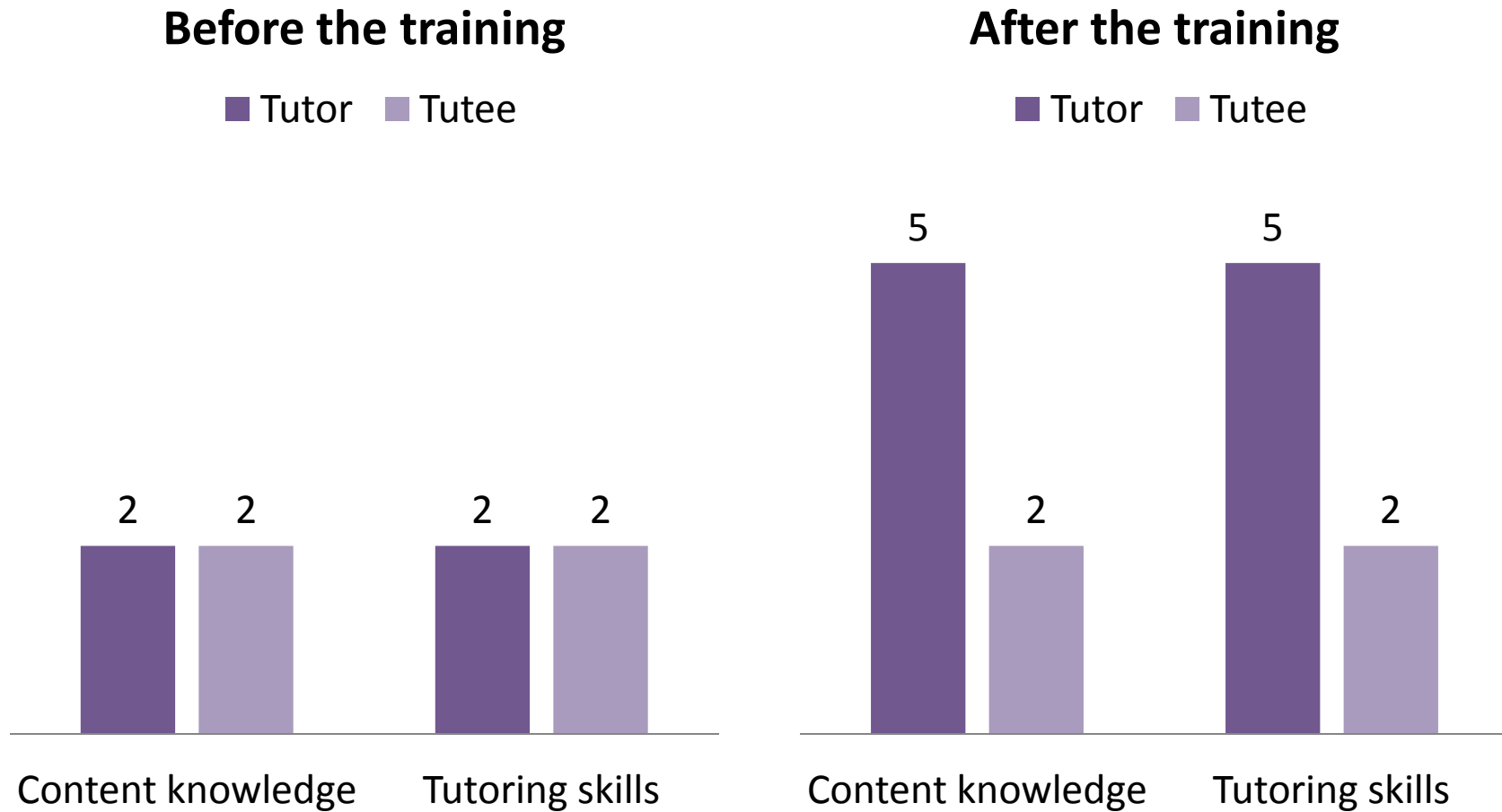


Tutor training



But why is tutor training necessary?

True peer tutoring



Task complexities

- Complex tasks → simultaneously deal with several **interactive** information elements
→ higher cognitive skills → a **high cognitive load**
- So, what kind of peer tutors can better alleviate tutees' high cognitive load when working on complex tasks? A peer tutor with more content knowledge or a tutor with more tutoring skills?

Research question

- **What are the effects of enhancing peer tutors with two competences on **tutees'** and **tutors'** cognitive load and task performance?**

Participants

- Four classes of secondary school students, aged 16-17, $n = 88$
- Two classes were randomly assigned for each treatment
- Within each class, half of the pupils acted as tutors and the other half acted as tutees
- Tutor-tutee pairs were created randomly within each class

Subject: Civics

Topic: Replacing student grants with a student loan



Tutee task

- Statement: *The student grant should be replaced by a student loan.*
- Read the election programs from diverse political parties. Choose a **standpoint** pro or con the statement and make three **arguments** to support the standpoint, in which **two** are from the election programs and **one** is your own argument.



Background information of the task topic

CDA

SP NL



D66



Why is this task complex?

Pro



Con



Tutor training: Content knowledge (CK)

Factual knowledge of the task topic

Two government brochures about student grants and loans



Examples of arguments

- Two news articles about the debates on replacing the grant with a loan



Tutor training: Tutoring skills (TS)

Task-processing skills

- A worked example about *how* to make arguments on another topic
 - Statement, Standpoint, Arguments
 - Relationship between a standpoint and arguments
 - Sentence patterns of expressing arguments

Pedagogical skills

Rules and exercises of asking questions effectively

- Make sure that others understand your questions
- Ask others to clarify their answers
- Continue with asking questions
- Summarize answers from others

Pre-measures

- Prior knowledge test
- Tutoring skills questionnaire

Post-measures

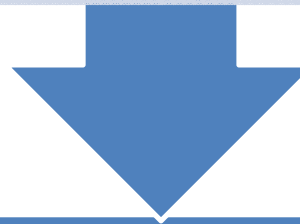
- Cognitive load on the task: NASA Task Load Index with six 20-point sub-scales
- Post-test (tot: 16)
 - One open question: Summary of tuttee task (tot: 10)
 - Three multiple choice questions (tot: 6)
- Questionnaire of evaluating the tutoring process with eleven 5-point Likert scales (tot: 55)

This study: Each session 50 mins

Session 1: Introduction, pre-measures and tutor training

Tutees read “Types of questions”

Tutors received training



Session 2: F2F Peer tutoring on the task and post-measures

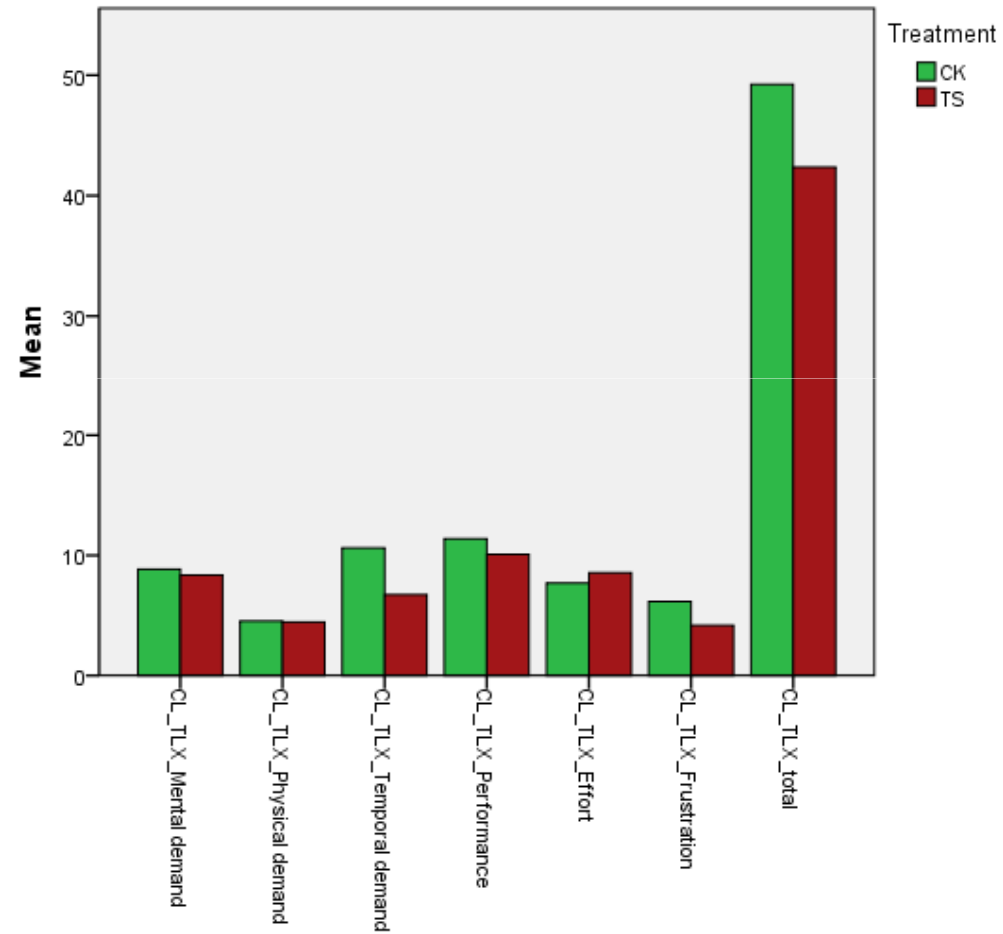
Tutees first read standpoints pro or con the statement from diverse political parties.
And then tutees worked on the task.

Tutors first read standpoints pro or con the statement from diverse political parties.

And then tutors helped tutees by using instructions based on the training materials.

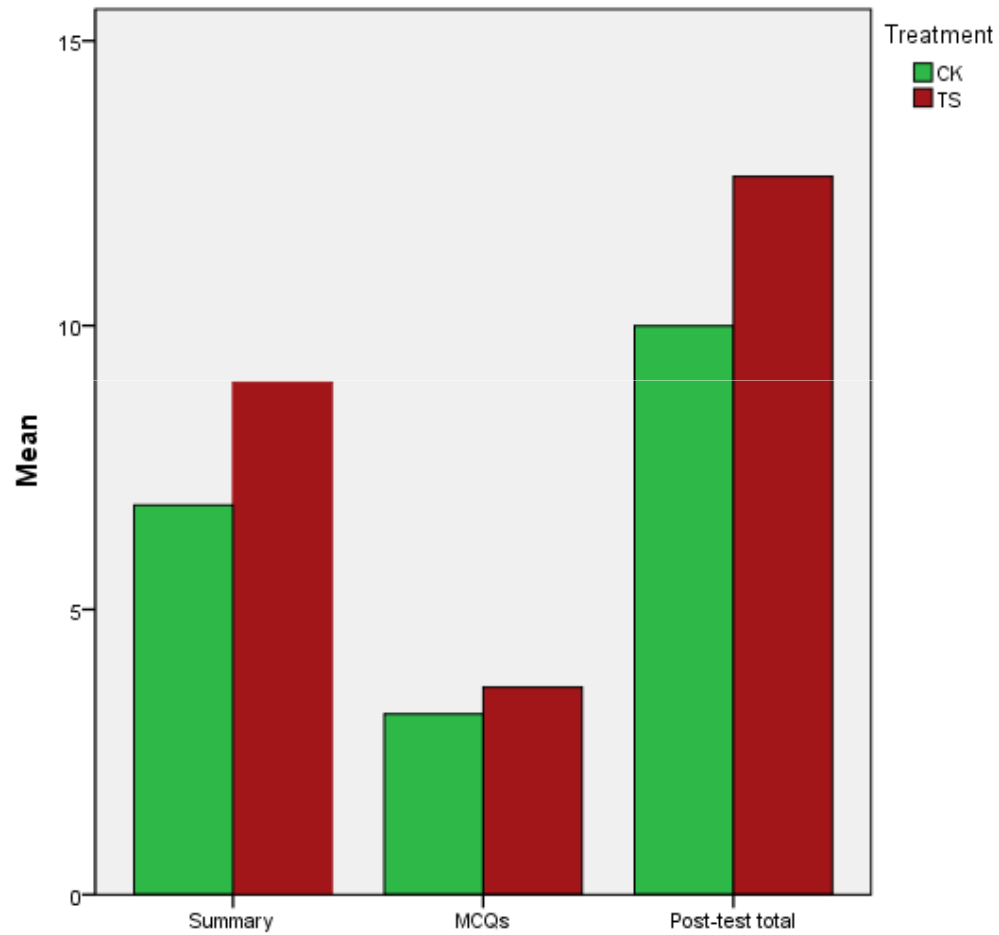
Tutee results Cognitive load

each subscale: 20, total: 120 (*n.s.*)

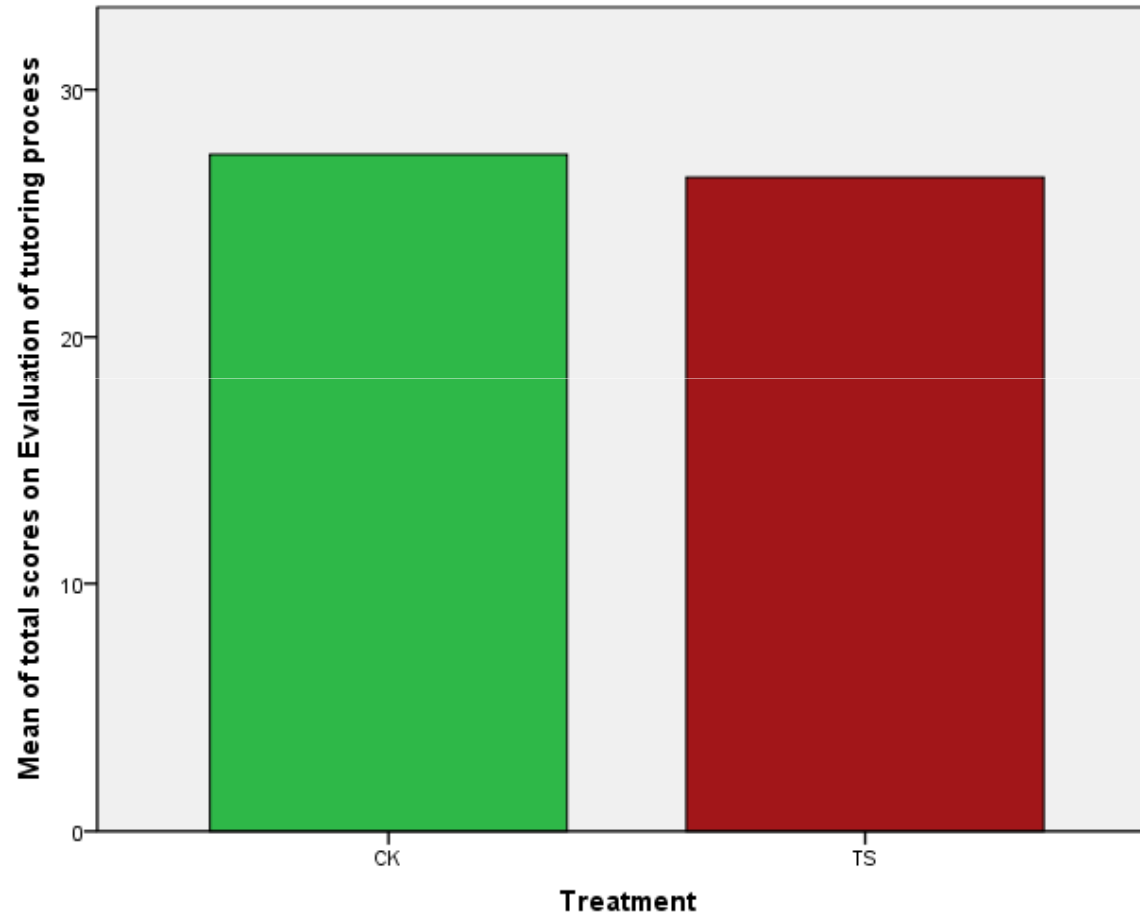


Tutee results Post-test, total: 16

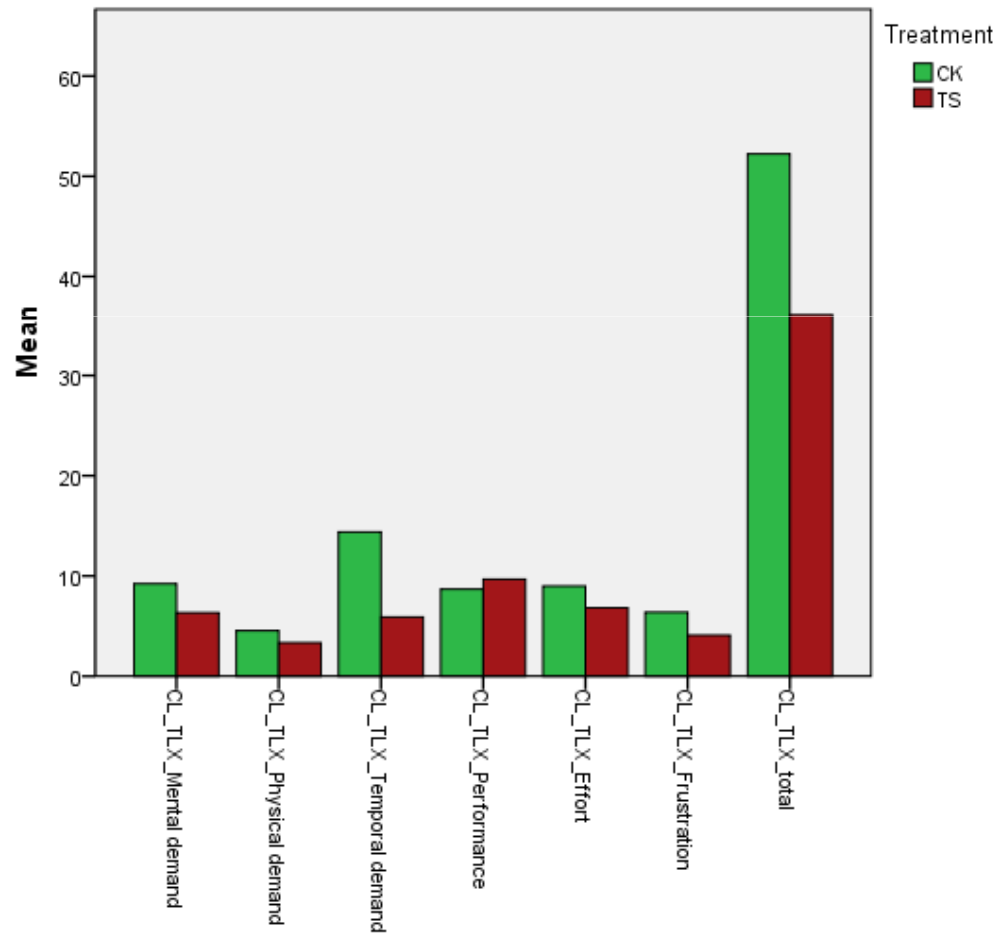
$t(21) = 2.87, p = .01$



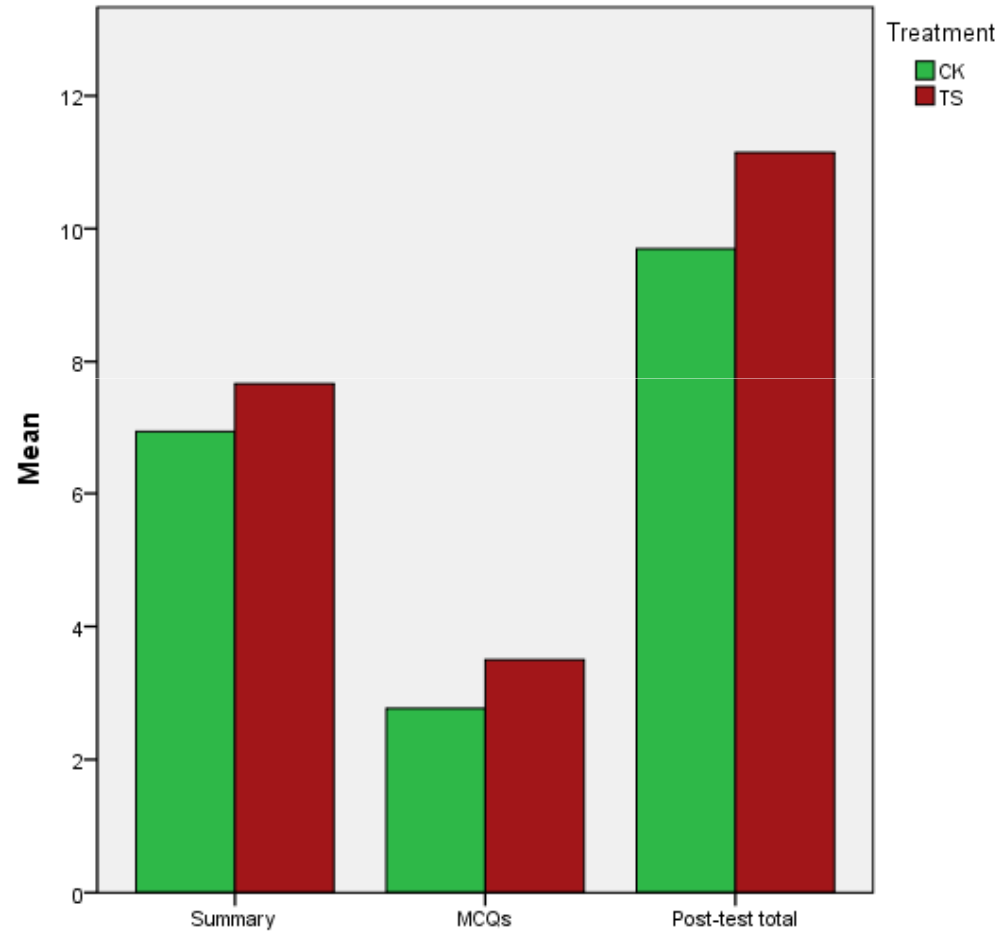
Tutee results Evaluation of tutoring process, total: 55 (*n.s.*)



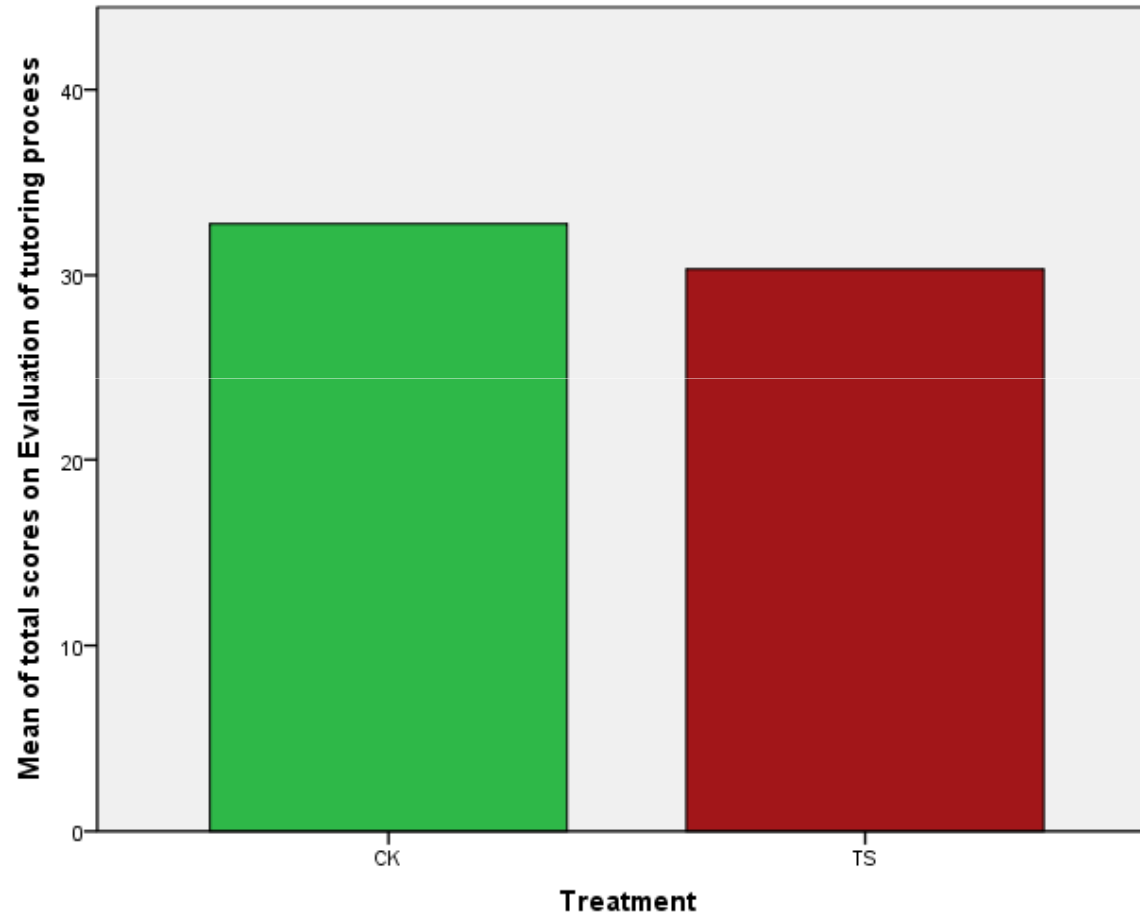
Tutor results Cognitive load
each subscale: 20, total: 120
 $t(23) = 2.87, p = .01$



Tutor results Post-test, total: 16 (*n.s.*)



Tutor results Evaluation of tutoring process, total: 55 (*n.s.*)



Conclusion

- TS tutors contributed to better tutee task performance than CK tutors.
- TS tutors experienced lower cognitive load than CK tutors during the tutoring process.
- Both groups of tutors and tutees did not evaluate the tutoring process at a satisfactory level.

Discussion

- Knowledge versus skills: Did TS tutors really have skills? Or they just started to transform procedural knowledge into skills?

Limitations

- No processing data to trace tutoring interactions
- No control group
- Missing values
- Very limited time for each session