



Metacognitive Support in Digital Learning Environments for Primary School Students

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INTRODUCTION & AIM

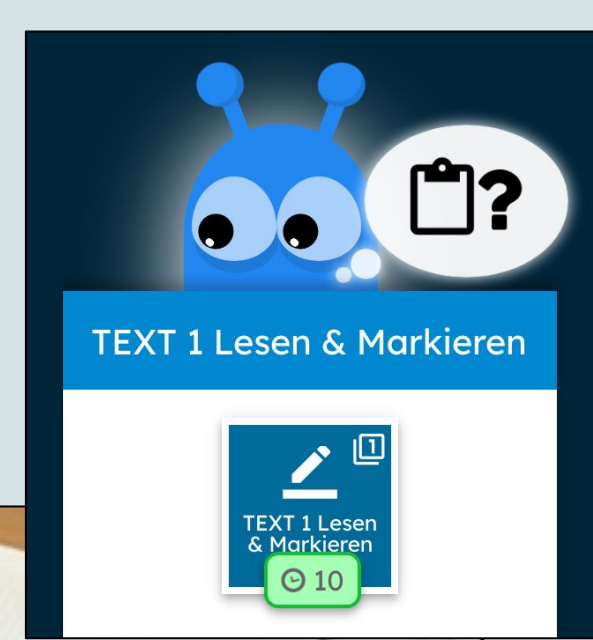
Challenges & Opportunities for SRL-Support:

- Effective learning in digital learning environments (DLE) requires a degree of proficiency in self-regulation skills that especially younger students in primary school still need to acquire.
- Digital metacognitive prompts offer new formats, high flexibility regarding timing and frequency and new opportunities to activate and automate metacognitive activities.



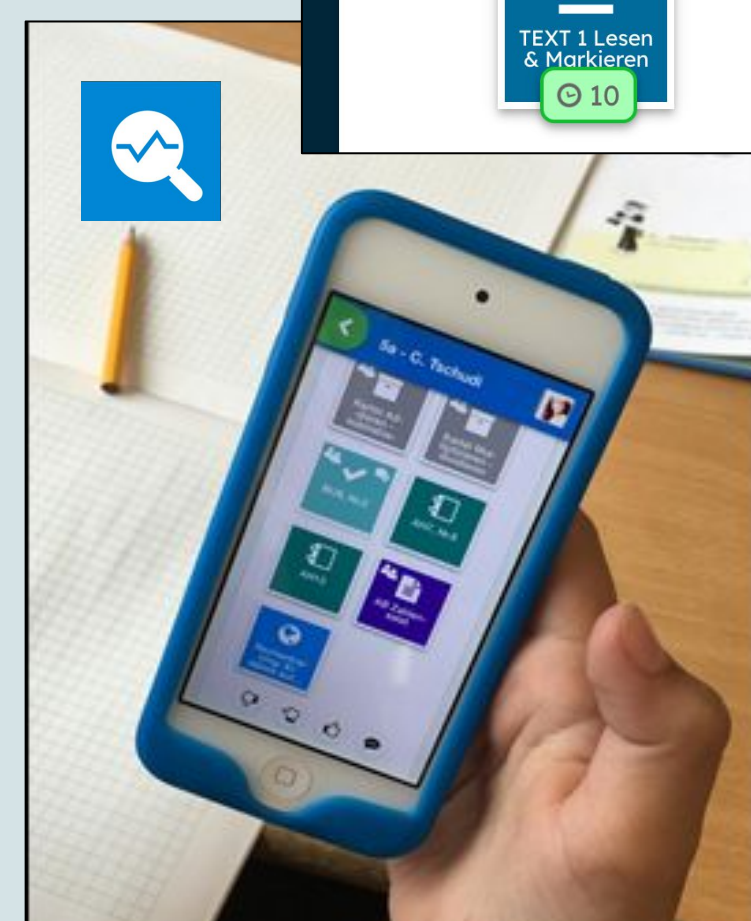
Aim:

- Development and testing of a software-based support system (L2L-Assistant), which aims to assist primary school students in their planning and - by providing metacognitive prompts - their monitoring & evaluation of the learning process.



Research Questions:

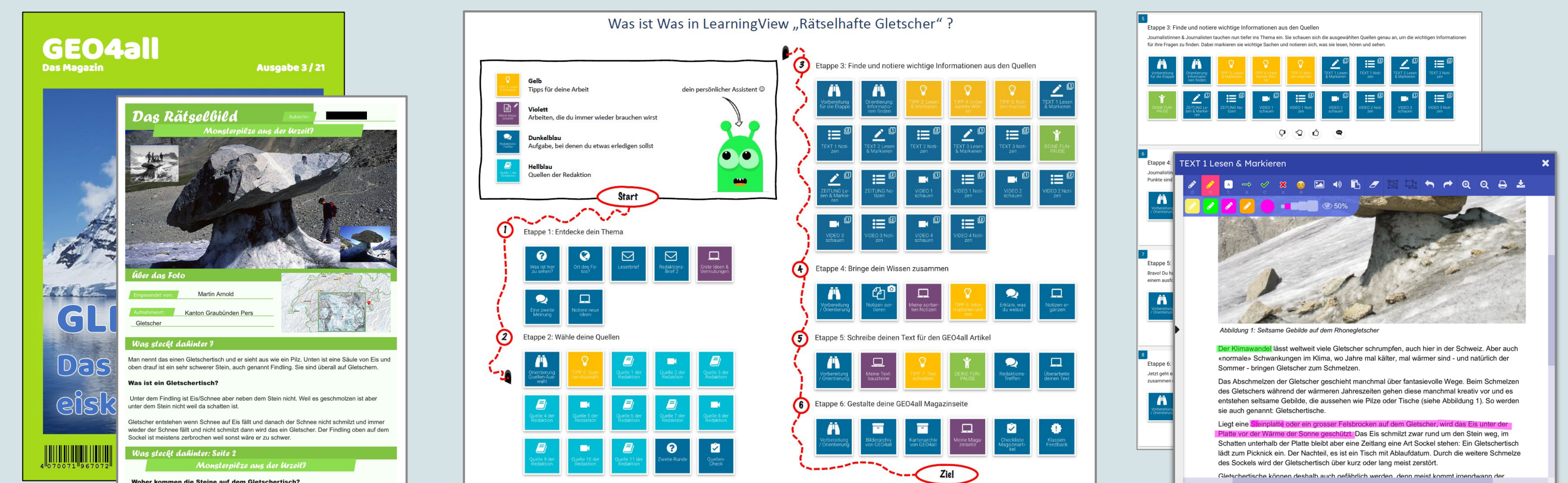
- How do students experience the L2L-Assistant (motivation, support, stress)?
- Do students report experiencing a higher degree of metacognitive activity during the intervention?
- Better learning outcomes?
- Positive influence on SRL-attitudes, -competence & strategy use?
- Interindividual differences?



DESIGN & INTERVENTION

Learning Unit:

In order to empirically test the L2L-Assistant, we developed a learning unit in the learning management system LearningView in the subjects *Media & Computer Science* and *Nature-Man-Society*. This learning unit (titled "Mysterious Glaciers") consisted of 12 lessons spanning a period of 3 weeks, where students wrote an article for a fictitious magazine. Students had to process and synthesize information from different sources (text, video) about a specific geological phenomenon and answer three expert questions for the (imagined) audience of the magazine. Students worked independently with minimal teacher guidance and were supported by the task design, which included the application of cognitive strategies (e.g. highlighting, note taking, information integration).



Learn2Learn-Assistant:

Embedded in this learning unit, students were provided with a software-based support tool for planning and monitoring their learning activities.

Control group:

planning feature

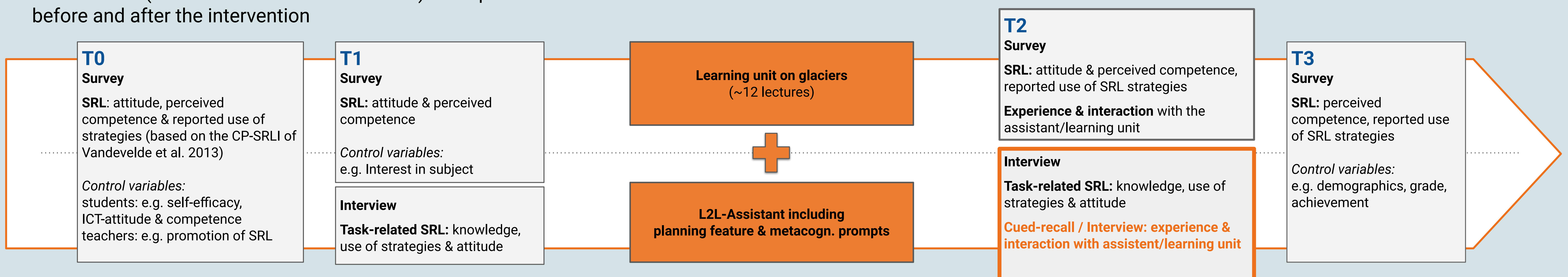
Experimental group:

planning feature + metacognitive prompts before, during and/or after specific tasks

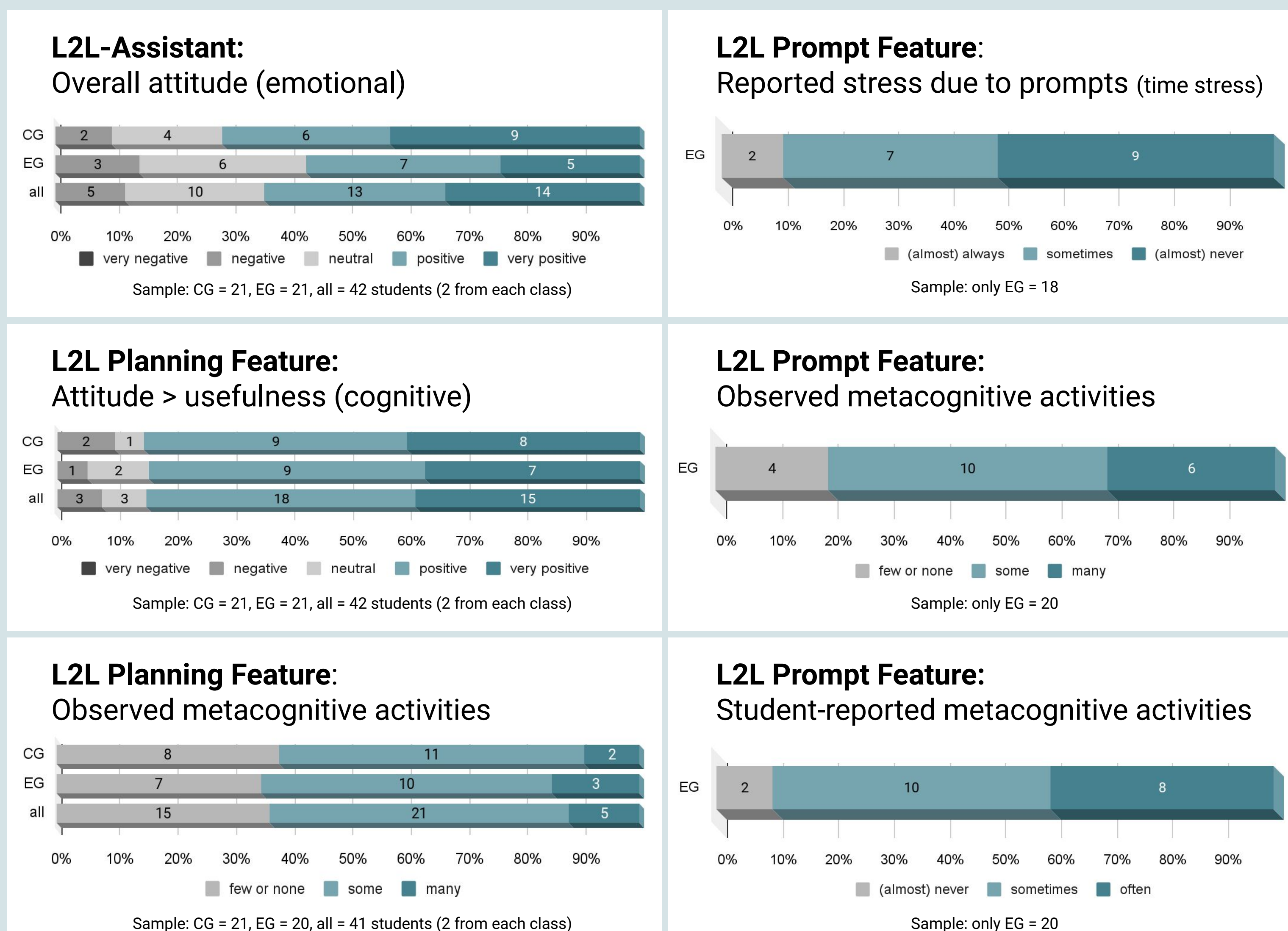


METHODS

- Pre-post experimental design, with half of the students from each class randomly assigned to the experimental group and the control group (within class randomization)
- 375 students at grades 5/6 (aged 10-12, 47% female, 53% male) from 21 classes took part in the intervention and answered online questionnaires at four time points
- 42 students (1 EG & 1 CG from each class) took part in video-based interviews before and after the intervention



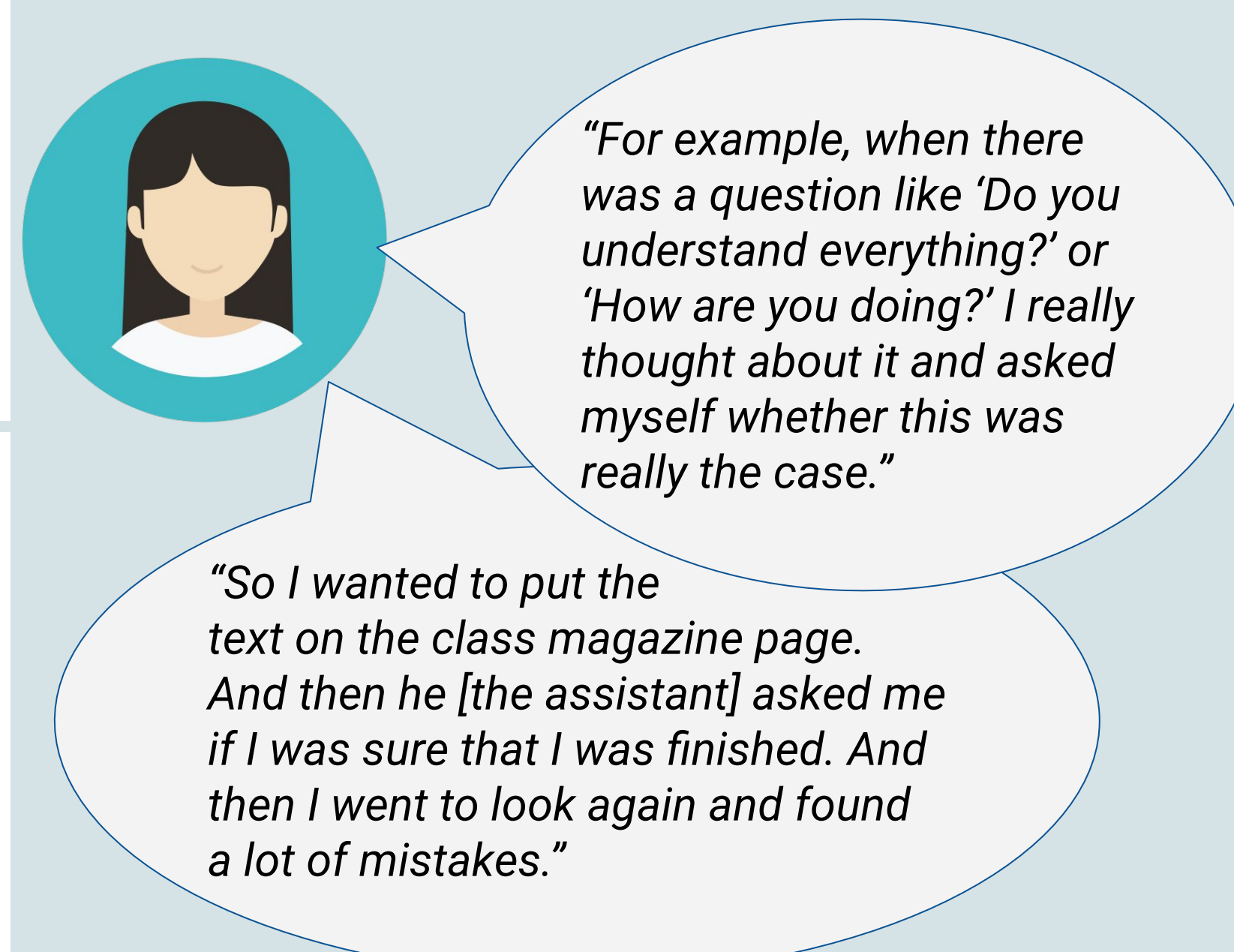
FIRST FINDINGS



CONCLUSIONS

A majority of students liked the assistant (fun, motivating) and almost all students experienced the planning feature as useful. Students of both groups spontaneously reported metacognitive activities triggered by the planning feature.

Reactions towards the prompting feature were also positive but showed much higher variability for different students types. Some students felt distracted in their learning process or stressed by too high a frequency of prompts. Nevertheless, a majority of students reported that they sometimes or often increased their monitoring and checking behavior and were also observed in spontaneously verbalizing metacognitive activities.



Next:

- explore characteristics of students who did or didn't feel supported by prompts
- continue with further analysis (SRL-task; SRL-questionnaires; learning outcomes, log data)
- explore possibilities/conditions for "adaptive nudging"

