

MTA-SZTE Geography Methodology Research Group

Annual report at the end of the first year, 30.09.2022.

Measurements conducted by our Methodology Research Group in the 2021/2022 academic year

The objectives of our research group include the application of modern measurement tools to monitor, categorize and analyze learning and task-solving strategies in situ to support the design and application of teaching tools, materials and tasks. Our primary aim is to identify movement and physiological patterns that can indicate levels of learner engagement and interest and their changes during task performance. In addition to the analysis of physiological data, we will of course also collect questionnaire data on learners' accounts, experiences, academic achievements and interests, in order to investigate the relationships between reflective, self-awareness and more hidden physiological events. To achieve these goals, our research team began collecting data along two task types.

1. Solving complex geography textbook problems - measured with eye-tracking

In this task, after taking a pre-knowledge test, students' eye movements are measured in three situations: during reading of the tasks, during processing of the available textbook pages and finally during answering of questions related to the processed material. The survey was concluded by an extensive questionnaire, in which the experiences and knowledge related to the processed material are assessed. Our preliminary data analyses are conclusive that there are significant differences between individual strategies. Further work and data collection will be needed to uncover richer and more informative relationships between prior knowledge and the steps of processing.

2. Map using exercises measured with eye-tracking and multisensor device

In this exercise, 12 tasks per map were to be solved using a map which is not part of the course material covered by the participants. The complexity of the tasks increases during the course of the measurement. In this task, in addition to recording eye movements, sound is recorded (the tasks are solved orally) and data is also provided by the sensors of the Energowatch wrist strap smart device. These sensors measure the accelerations generated by the skeletal muscles and also record heart rate and blood oxygen density with high data density. The surveys so far have involved students aged 13 to 19 years.

In addition to these two investigations, our research team also focuses on the continuous monitoring and summarisation of the literature related to our research.

Szeged, 2022. 09. 28.



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