

Physically active academic lessons (PAAL) in general upper secondary school – the PAAL study protocol

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Purpose:

To explore the acute effects of physically active academic lessons (PAAL) on students' situational engagement and executive functions, and factors modifying these effects in general upper secondary school.

Methods:

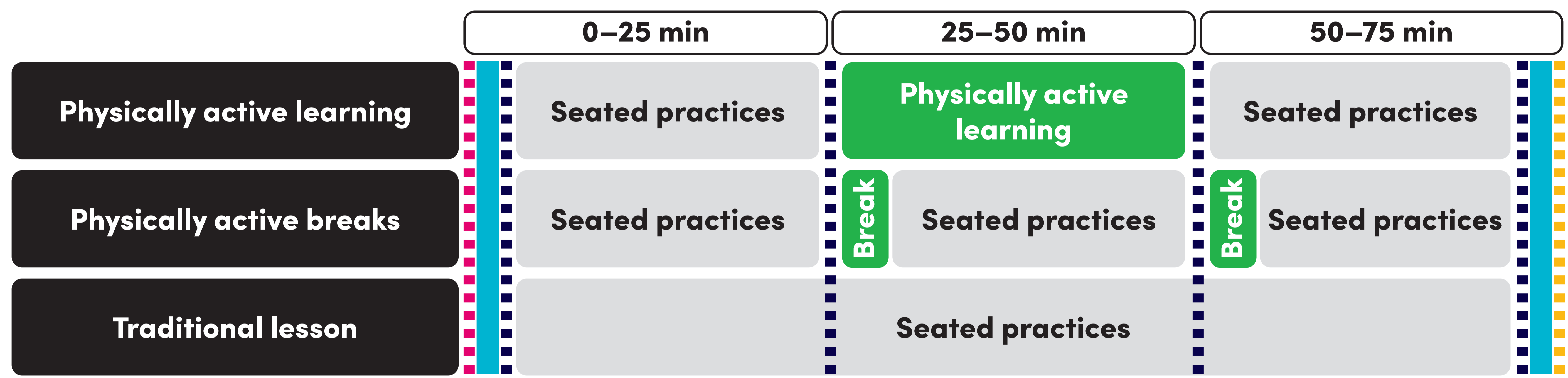
Study design: A cluster-randomized individual crossover trial, with following treatments:

- 1) PAAL with 20 min of physically active learning
- 2) PAAL with two 5 min physically active breaks (not related to learning goals)
- 3) traditional lessons without physical activity (control group)

Participants:

Math and foreign language students in general upper secondary school are recruited (N~150, mean age 17 years)

Structure of the lessons and the measurements



- ■ ■ ■ Baseline questionnaire
- Inhibitor with modified flanker tasks
- ■ ■ ■ Alertness with the Karolinska Sleepiness Scale
- ■ ■ ■ Situation-specific classroom engagement with the InSitu Instrument
- Physical activity and load with accelerometers (Axivity on thigh) and heart rate variability monitors (Firstbeat Bodyguard)

Other measurements:

Mental load, physical and academic competence, socioeconomic status, and learning or functional difficulties.

Practical implications:

The study provides evidence-based recommendations for physically active teaching strategies to support students' learning and well-being.

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