From Distraction to Meta-Awareness
Self-Regulated Learning and the Wandering Mind

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1 Introduction

Figure 1: Student mind wandering

- Mind wandering is a distractions from self-regulated learning (Brady et al., 2021)
- Mind wandering occurs ~30% of the time during learning and has a negative relationship with learning outcomes (Wong et al., 2022)
- Self-regulated learners adapt to distractions

2 Background

Off-Task Thought: Two types of stimulus-independent thoughts (Stawarczyk et al., 2011)
- Mind wandering (stimulus-independent and task-unrelated)
- Task-related interference (stimulus-independent and task-related)

Meta-Awareness: Learners can become aware of their off-task thoughts (Schooler et al., 2011)

Self-Regulated Learning: COPES model chosen to underpin thesis because it is based on metacognition (Winne & Hadwin, 1998)

3 Research Questions

RQ1: How often does task-related interference occur during learning?
RQ2: How strong is the relationship between task-related interference and learning outcome?
RQ3: How does self-regulated learning influence off-task thoughts when learning from a video?
RQ4: How does self-explanation during video watching influence off-task thoughts compared to interpolated testing?
RQ5: Is the relationship between self-regulated learning and off-task thought frequency consistent or different when comparing naturalistic (case study) and controlled (experiment) settings?

4 Model

Co-Authors: Caitlin Mills, University of Minnesota & Phil Winne, Simon Fraser University

- Learners react to their realisation of off-task thought
- Learners' reactions depend on the type of off-task thought

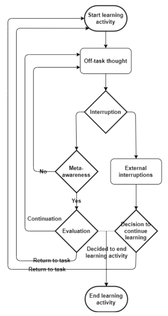

Figure 2: Self-regulated learning and off-task thoughts interaction model

5 Meta-Analysis (RQs 1+2)

Co-Author: Andrew Zamecnik, University of South Australia

- Frequency of task-related interference and relationship with learning outcome is unknown.

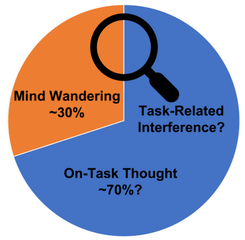

Figure 3: Thought type distribution

Preregistration

Data Collection

6 Case Study (RQ3)

Figure 4: Student mind wandering

- Off-task thought has mostly been studied in laboratory settings, in which learners could not react to their off-task thoughts
- This study is in a naturalistic setting and learners can react to their off-task thoughts

7 Experiment (RQ4)

Interpolated Testing vs **Self-Explanation**

Figure 5: Laptops showing interpolated testing and self-explanation pop-ups

- Interpolated testing has been shown to reduce mind wandering (Welhaf et al., 2022)
- Self-explanation writing improves learning outcomes and could also affect mind wandering.

Preregistration

8 Comparison (RQ5)

Experimental vs **Naturalistic**

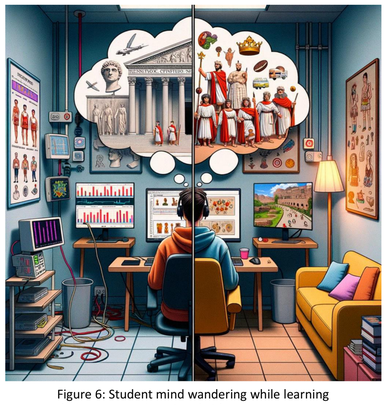

Figure 6: Student mind wandering while learning during an experiment and at home

- Unclear to which degree results from experimental studies can be transferred for use in a naturalistic setting
- Compare learners off-task thoughts across settings based on their self-regulated learning skill

9 Contribution

Self-regulated learning and off-task thought interaction model	
Mind wandering meta-analysis by Wong et al. (2022)	Task-related interference meta-analysis

Description of how often learners need to react to which kind of off-task thought.

compare to

Case study results of how often off-task thoughts occurred in a naturalistic setting	Experiment results on how learning activity influence off-task thought occurrence

Results can be used to design self-regulated learning interventions to reduce off-task thought and improve learning outcomes.

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