Title

Self-Regulated Learning and Mind Wandering in Video-Based Learning: A Naturalistic Study

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Abstract

Video-based learning is commonplace in higher education. While videos offer flexibility and convenience, they also require sustained attention. Learners frequently experience mind wandering that can negatively impact on their learning. However, self-regulated learning strategies can help to mitigate these attentional lapses. This naturalistic case study explored how students' self-regulated learning aptitude relate to their awareness of mind wandering. The study included observations of video rewinding behaviour after students become aware of mind wandering. Fifty-three undergraduate students completed the self-regulation for learning online (SRL-O) questionnaire and reported instances of mind wandering during video-based learning. Students with higher scores on Online Effort Regulation and Planning and Time Management reported fewer instances of mind wandering. Students rarely rewound the video despite recognising instances of mind wandering. This prompts questions about whether students require explicit guidance on how to respond when becoming aware of their mind wandering.

Extended Summary

Although instructional videos are commonplace in higher education, students often struggle to sustain their attention when learning from these resources (Brady et al., 2021). Previous literature (e.g. Wong et al., 2022) claims mind wandering (thinking about something unrelated) occurs about 30% of the time and can negatively impact learning outcomes. However, this view of mind wandering during learning overlooks the learners' ability to self-regulate. Self-regulated learning (SRL) refers to the processes by which learners set goals, monitor their progress, and adapt their strategies to achieve learning objectives (Panadero, 2017). A part of SRL requires learners to engage in metacognitive monitoring and control (Winne & Azevedo, 2022). Through metacognitive monitoring students may become aware of their mind wandering (Schooler et al., 2011) and adjust their learning process in response (Varao-Sousa et al., 2017). Prior research on mind wandering during video-based learning has typically constrained the learners' ability to self-regulate by preventing the learner from pausing or rewinding (e.g. Welhaf et al., 2022), leaving open questions about how SRL relates to meta-awareness of mind

wandering and to subsequent behavioural changes which is addressed in this study through the following research questions:

This study aimed to investigate how students' self-regulated learning aptitude relates to their awareness of mind wandering and their behavioural responses, leading to the following research questions:

RQ1: Is there a relationship between self-regulated learning aptitude and the rate of self-caught thought reports during video watching?

RQ2: To what extent do university students rewind educational videos following self-reported mind wandering?

To explore these RQs, a naturalistic case study was conducted in an authentic university learning environment involving eight courses where enrolled students were invited to participate. The participants first completed the self-regulation for learning online (SRL-O) questionnaire (Broadbent et al., 2022), developed specifically for an online or blended learning context. Five subscales of the SRL-O were selected as they related to the aim. The subscales were: Metacognition, Online Task Strategies, Online Effort Regulation, Study Environment, and Planning and Time Management. After completing the questionnaire, participants watched their regular course videos while reporting their mind wandering. Additionally, the participants' interactions with the video player were logged. Importantly, no instructions were given about rewinding. Therefore, any rewinding is not a consequence of the task instructions. RQ1 was investigated using a zero-intercept generalised linear model with a negative binomial distribution and an offset for time on task. RQ2 was explored by analysing the video player tracking data, specifically counts of when participants rewound the video after reporting mind wandering.

In addressing RQ1, the results showed that the subscales of Online Effort Regulation and Planning and Time Management were negatively associated with self-caught mind wandering. For RQ2, 15 cases of rewinding following mind wandering events were identified, out of a total of 317 self-reported cases.

Learners with high Online Effort Regulation scores appear to be able to maintain focus for longer and thus report less mind wandering. Prior work indicates that mind wandering increases over time (Risko et al., 2012) and that learners who are skilled at planning, time management, and effort regulation tend to have longer learning sessions (De Barba et al., 2020). Present findings could be attributed to learners utilising their Planning and Time Management skills to plan how to approach a video-learning task and determine how much effort to exert (Online Effort Regulation), thereby delaying the onset of frequent mind wandering and enabling longer video-watching sessions. Our results showed that rewinding following mind wandering rarely occurs. This suggests

that students may require guidance to enact effective reactions to mind wandering events.

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Keywords

self-regulated learning, mind wandering, video-based learning, adaptation