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A Wandering Mind in Online Learning: Why It Is Normal, and What Skilled Learners and Good Design Can Do About It

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Imagine you caught yourself thinking about something unrelated while learning.

How do you feel about it?

How often are we thinking about something unrelated while learning?

Introduction

- Sustained attention is impossible (Sharpe & Tyndall, 2025)
- Mind wandering occurs ~30% of the time while learning (Wong et al., 2022)
- Mind wandering frequency increases over time (Szpunar et al., 2013)
- Mind wandering negatively impacts learning (Wong et al., 2022)
- Awareness of mind wandering is possible (Schooler et al., 2011)
- Adjusting the learning process after mind wandering is an act of self-regulation (Ebbert et al., 2026)

Meta-Awareness

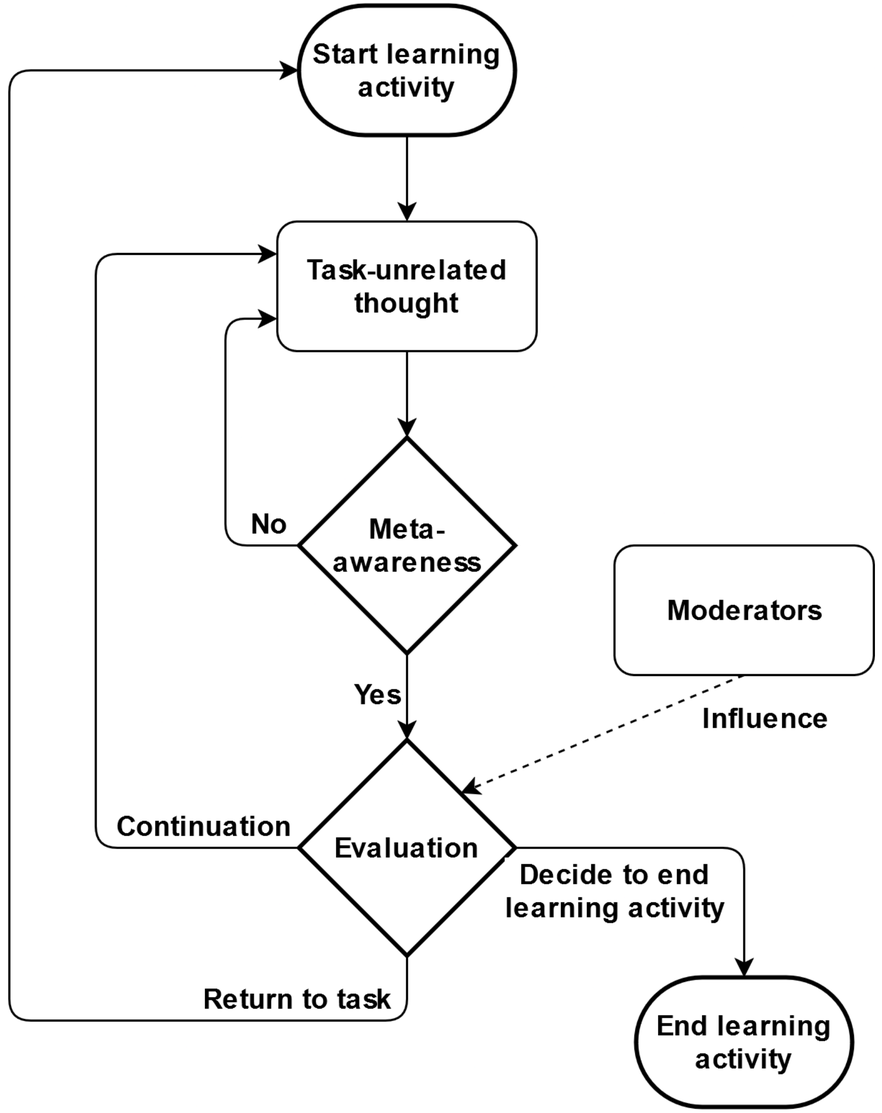
- Capacity to explicitly recognize and reflect on one's mental state (Schooler et al., 2011)
- Meta-awareness is a form of metacognitive monitoring
- Metacognitive monitoring is part of self-regulated learning (Winne & Azevedo, 2022)

Self-Regulated Learning

- Regulation of cognition, metacognition, affect, and motivation (Winne & Azevedo, 2022)
- Based on COPES facets of tasks (Winne & Hadwin, 1998)
- COPES = **C**onditions, **O**perations, **P**roducts, **E**valuations, and **S**tandards
- Intermittent metacognitive monitoring and control

Theoretical Framework

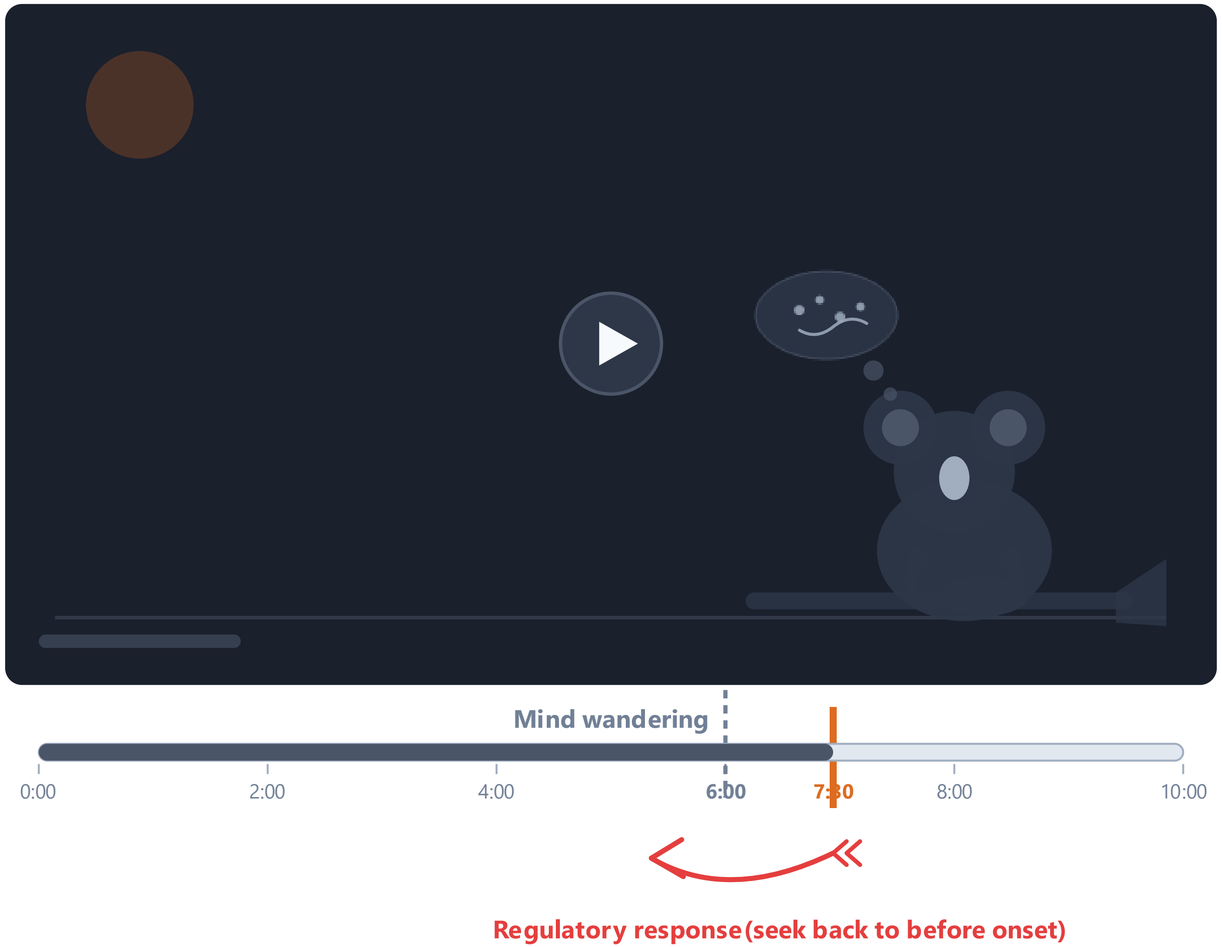
- Self-regulated learners will report more mind wandering
- Learners become aware of their mind wandering and can react
- Meta-awareness of mind wandering seen as a metacognitive trigger for self-regulation (Järvelä & Hadwin, 2024)



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Trigger and Regulatory Response

- Trigger: Awareness of mind wandering
- Regulatory response: Rewinding to before mind wandering started

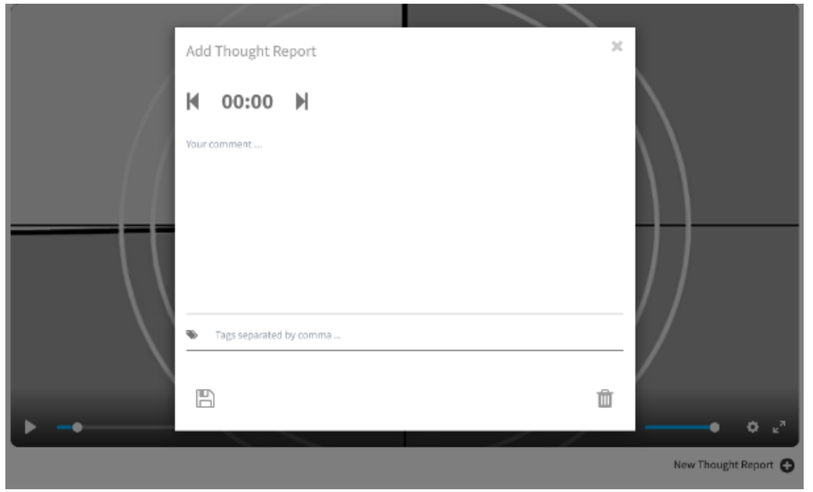


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Common Elements

- Self-regulated learning aptitude measured using SRL-O (Broadbent et al., 2022)
- Video-based learning
- Self-caught thought reports





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Studies Overview

Study 1

- Naturalistic study in an authentic course setting to observe a regulatory response (rewinding) following mind wandering

Study 2

- Experiment to test whether rewinding following mind wandering balances out the effect of frequent mind wandering

Results

- Higher scores on self-regulated learning related to mind wandering frequency in both studies
- Rewinding rarely occurred
- Learners who rewound, did not perform better on a post-test

What are students thinking about?

- Why did rewinding rarely occur?
  - Could it have something to do with what the students are thinking about?

- Thematic analysis of thought reports

Developed Themes

- Course Related
- Previous Experience
- Judgements
- Adaptation
- Reactive Distractions
- Embodied Experience
- Current Concerns
- Social Relationships
- Multitasking

Course Related

- Thoughts related to:
  - The course and related aspects
  - Assignments, etc.
- Example: "thinking about how many notes ill have to write after the lectures" [P18]

Previous Experience

- Thoughts related to:
  - Previous encounters with related materials
- Example: "Thinking about when i done this topic in year 12 biology" [P18]

Judgements

- Thoughts related to:
  - Judgements of learning
  - Judgements about the current content
- Example: "NO THIS IS THE TOPIC THATS REALLY TEDIOUS" [P38]

Adaptation

- Thoughts related to:
  - Adapting the learning process
  - e.g. pausing the video
- Example: "plane flew overhead, had to pause" [P47]

Reactive Distractions

- Thoughts related to:
  - Students focus being pulled away by external distractions, e.g. noise
- Example: "Who keeps texting me" [P18]

Embodied Experience

- Thoughts related to:
  - The students bodily needs.
  - Hunger, thirst, sleep, etc.
- Example: "that I am hungry and what food I can make after this that I can eat" [P29]

Current Concerns

- Thoughts related to:
  - Unresolved personal circumstances
  - Finances, obligations, etc.
- Example: "just thinking about having to return a stressful call from work that I got just before this" [P43]

Social Relationships

- Thoughts related to:
  - Social relationships and social responsibilities
  - Picking up children, cat jumping on the keyboard, family members interrupting them
- Example: "I might call mum after this" [P18]

Multitasking

- Thoughts related to:
  - Other tasks they are currently engaged in
- Example: "Watching Doctor Who" [P16]

Recap

- Literature
  - Mind wandering is claimed to negatively impact learning
  - Mind wandering occurs about 30% of the time while learning
  - Mind wandering increases over time
- My work
  - Students can become aware of their mind wandering, but rarely adjust their learning process afterwards
  - Self-regulated learners mind wander less
  - Some mind wandering is still related to the task, other relates to the students lives

Recommendations

- Three audiences, one evidence base: what students think about, and how they regulate.
- Life-related thought (Embodied Experience, Current Concerns, Social Relationships)
  - Recommendations for students
- Task-relevant thought (Course Related, Previous Experience, Judgements, Adaptation)
  - Recommendations for lecturers
- Conditions and structure (Reactive Distractions, Multitasking, time on task)
  - Recommendations for learning designers

Recommendations for Students

- Plan for mind wandering rather than trying to prevent it: it occurs roughly 30% of learning time and increases across longer sessions
- Reduce avoidable triggers before you start: sleep, meals, interruptions
- Build self-regulated learning capacity: higher SRL related to less frequent mind wandering in both studies
- When you catch yourself, make a deliberate adjustment: rewinding was rare and brought no post-test benefit, so the choice of response is yours

Recommendations for Lecturers

- Expect frequent mind wandering. It is not a marker of a bad class or a poor student
- Harness task-relevant thought: prior experience and judgements of learning are material to build on, not distraction to suppress
- Match your response to the thought content: life-related thought calls for flexibility

Recommendations for Learning Designers

- Keep segments short: mind wandering increases over time
- Keep videos under about 10 minutes and texts to equivalent reading time
- Make adaptation easy: students already pause and navigate on their own. Chapter marks and clear structure turn interruption into deliberate re-entry
- Surface prior experience: students spontaneously connect new content to what they already know
- Assume divided attention: noise and parallel tasks are normal. Design content that survives interruption: predictable structure, clear resumable points

Thank you!

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