

DIGITAL NUDGING FOR COGNITIVE OFFLOADING IN GENERATIVE AI-MEDIATED LEARNING

STATEMENT OF RESEARCH PROJECT

As Generative AI (GenAI) becomes increasingly embedded in online learning environments, educators are growing concerned about cognitive offloading, whereby cognitive tasks are delegated to GenAI systems. Cognitive offloading is defined as the use of external agents or environmental structures to reduce the demands placed on internal cognitive resources (Risko & Gilbert, 2016). Gerlich (2025) identified cognitive offloading as the principal mediating mechanism in GenAI-mediated learning environments and noted that it negatively affects critical thinking. Yet, cognitive offloading and how to mitigate it in GenAI learning environments remain insufficiently understood.

This study proposes nudging as an intervention to mitigate cognitive offloading in GenAI-mediated learning environments. The concept of nudge, proposed by Thaler and Sunstein (2008) offers techniques for influencing users and, subsequently, changing behavior. While the potential of digital nudging (nudging in a digital environment) to support learners across multiple facets of the educational process has been established, its role in mitigating cognitive offloading remains underexplored.

The proposed research question is: How can digital nudging be implemented to mitigate cognitive offloading in Gen AI-mediated learning environments?

Gerlich, M. (2025). AI tools in society: Impacts on cognitive offloading and the future of critical thinking. *Societies*, 15(1), 6.

Risko, E. F., & Gilbert, S. J. (2016). Cognitive offloading. *Trends in Cognitive Sciences*, 20(9), 676–688.

Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness*. Yale University Press.

SCOPE OF WORK FOR SELECTED PHD STUDENT

The selected PhD student will first conduct a systematic literature review on cognitive offloading to identify key individual and environmental factors that may contribute to over-reliance on GenAI in technology-mediated learning environments. Building on the review, an empirical study will examine the formats and acceptability of digital nudges in GenAI learning environment as well as how learner characteristics, task demands, and GenAI features influence cognitive offloading and critical engagement with AI-generated information. This is followed by developing the digital nudging intervention based on the empirical study and systematic literature review. Finally, intervention studies will design and evaluate strategies, such as digital nudges, to mitigate excessive cognitive offloading and promote more active, reflective, and self-regulated learning with GenAI.