Cognitive Ease at a Cost — A TUM Munich Randomised Experiment Finds ChatGPT Lowers Students' Mental Effort but Weakens Their Reasoning vs Google Search

AI in Education · Good practice · Germany

Quality score: 33/100

Evidence strength: Cautionary / limited

Summary

91 German university students were randomly assigned to research a science question with ChatGPT-3.5 or Google. ChatGPT users reported much lower cognitive load but wrote lower-quality justifications. A peer-reviewed cautionary result for unguided AI use in inquiry.

Key dimensions

Dimension	Score
Evidence of learning impact	1/3
Equity & inclusion	0/3
Transparency, ethics & data protection	2/3
Teacher capability & pedagogy	1/3
Scalability & sustainability	1/3

Evaluated by C-NAPSE

Data sources

C-NAPSE web research — accessed 2026-11-23

Technical University of Munich (Chair of Teaching and Learning with Digital Media), with LMU Munich and the University of Augsburg — accessed 2026-11-23

TUM research portal — publication record — accessed 2026-11-23

PsyPost — study summary — accessed 2026-11-23

DOI 10.1016/j.chb.2024.108386 — accessed 2026-11-23

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