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Title: Human-AI collaboration and the future of education

Summary
(min 200, max 500 words):

Artificial Intelligence (AI), including generative AI (GenAI), is rapidly transforming educational settings in many ways. To succeed in our today's society, learners need to combine expertise and ideas, solve problems and create new knowledge in various collaborative situations. In the age of generative AI, this means coordinated working not only with co-learners, but also increasingly with multiple agents, including learning technologies. Since this is likely to extend spaces for learning and collaboration (e.g., to virtual environments), it also calls for research on human-AI-human interaction and the way in which AI can support learning and interaction processes (Cress & Kimmerle, 2023; Tan et al., 2022). Everyday interaction with AI is often seamless and implicit (e.g. recommender systems), whereas explicit interaction with AI agents (e.g., chatbots and intelligent tutoring systems) has the potential to provide personalised learning support for individuals and groups.

Lately, the process of collaboration between humans and AI has been named as Hybrid Intelligence (HI) (Molenaar, 2022). By leveraging strengths and mutually compensating weaknesses of humans and AI, HI has the potential of augmenting the capabilities of humans to work and learn more effectively together (Cukurova, 2024). Nonetheless, in addition to cognitive skills, human learning encompasses emotional and social components (Martınez-Miranda & Aldea, 2005), and the ability to interact with others and the world (Cukurova, 2024). Those capabilities are currently lacking in AI systems.

In our presentation, we will introduce an ambitious research agenda related to human-AI collaboration in our EDUCA Flagship project (https://educaflagship.fi/en), funded by the Research Council of Finland and bringing together academic and non-academic partners. The aim of EDUCA is to address the education of the future to support learners in reaching their potential by designing and implementing more adaptive education. We will investigate within-person, within-group, between-group and contextual variability in technology-enhanced learning and build next-generation, adaptive AI-based models to identify challenges and affordances for personalised learning. We will also explore the ways in which teachers integrate (generative) AI and learning analytics into teaching and learning. We will discuss the

upcoming research focusing on how cognition is distributed among learners and teachers, AI and their environments, and what human-AI-human collaboration could potentially mean for the present and future of education.

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