

Enhancing children's understanding, critical thinking and creativity through collaborative designing of AI apps

June 18 2024



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Children and young people's understanding of artificial intelligence and AI technologies improved when the basics of AI were taught in school

through hands-on activities supported by new educational technology, a recent study among more than 200 Finnish 4th and 7th graders shows.

The study explored how children's understanding and explanations of AI evolved as they engaged in collaborative designing of AI apps and explored the impact and ethics of AI. The work is [published](#) in *Informatics in Education* and [New Media & Society](#).

AI technologies are an integral part of our daily lives, even if we don't notice their existence. For instance, AI algorithms give us recommendations of news, music and movies that we might like, and they target personalized advertising to us. However, many schools are falling short when it comes to teaching children about where AI is used, how it works and what its impacts are.

Led by the University of Eastern Finland and involving three other universities and various other partners, the Generation AI project strives to respond to this challenge by developing research-based pedagogical models, educational technologies and curriculum materials for AI education. Spring 2023 saw the first round of AI education organized in schools in Joensuu, Finland, which also formed the basis for research.

Children were introduced to the basics of AI in three workshops. Researchers studied how children explained algorithmic bias and how these explanations evolved during the workshops. The findings show that children's data-driven explanations of the causes of algorithmic bias developed significantly during the workshops.

"Our findings suggest that the workshops enhanced children's conceptual understanding of artificial intelligence and of the ethical aspects associated with it. The workshops also taught them to critically evaluate AI technologies," Senior Researcher Henriikka Vartiainen of the University of Eastern Finland notes.

According to her, the findings highlight the importance of pedagogically sound AI education in schools, facilitated by educational technologies and curriculum activities that foster children's agency, understanding and ethical awareness in the age of AI.

"The workshops utilized concrete examples from children's everyday lives. During the first workshops, children brainstormed and created their own AI apps with the support of our new educational [technology](#), designed for novice learners," Postdoctoral Researcher Juho Kahila of the University of Eastern Finland says.

"Using the learning tool, children made an image classifier-based app of their own by following the data-driven design workflow, and they also tested those created by others. This enhanced children's understanding of how artificial intelligence works."

The third and final [workshop](#) focused on the societal and ethical implications of artificial intelligence. For instance, children created images with generative AI, searched for algorithmic biases in them and engaged in critical reflections and discussions of societal and ethical implications of AI.

"Connecting [artificial intelligence](#) with children's daily lives and giving them the opportunity to co-design and create AI apps together with classmates made learning from and with AI meaningful and exciting for [children](#)," Kahila notes.

More information: Juho Kahila et al, Pedagogical framework for cultivating children's data agency and creative abilities in the age of AI, *Informatics in Education* (2024). [DOI: 10.15388/infedu.2024.15](https://doi.org/10.15388/infedu.2024.15)

Henriikka Vartiainen et al, Enhancing children's understanding of algorithmic biases in and with text-to-image generative AI, *New Media & Society* (2024). [DOI: 10.1177/14614448241252820](https://doi.org/10.1177/14614448241252820)

Provided by University of Eastern Finland

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