

# AI and Traditional Learning: Complementary Strategies for Deeper Learning

Understanding how the use of generative AI impacts learning outcomes is key to creating effective guidelines for AI in education. Microsoft Research (MSR) and Cambridge University Press & Assessment conducted one of the first large-scale quantitative investigations into the impact of large language models (LLMs) on the foundations of learning: understanding and retaining information.

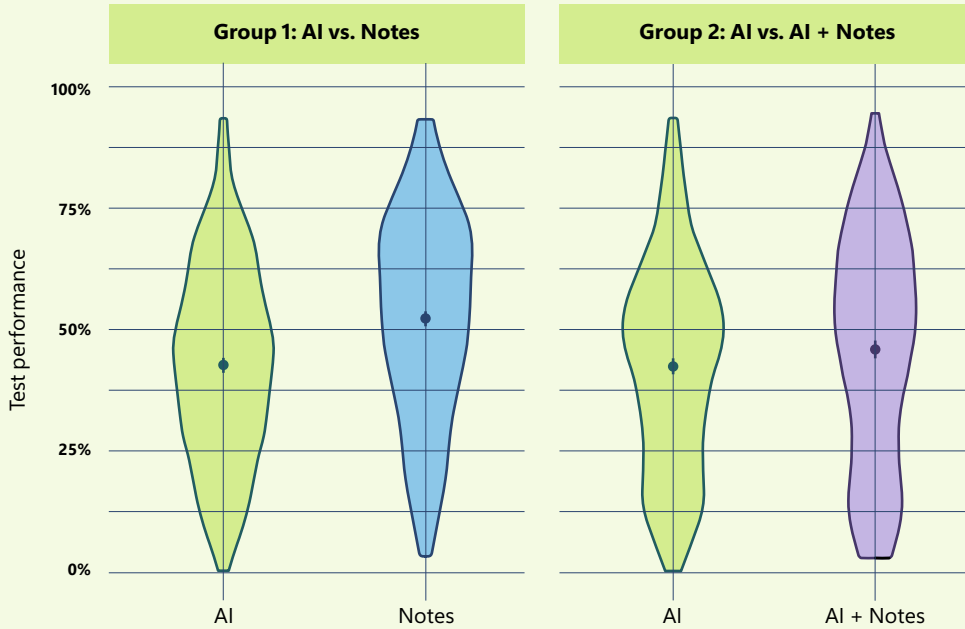
The research measured students' comprehension and retention of two texts. Participants were randomly assigned to study each text using one of three strategies: traditional note-taking, using an AI chatbot to answer questions about the text, or a combination of both.

The findings reveal the continued importance of traditional learning approaches. They also demonstrate the benefits of combining AI use with traditional learning over using AI alone, and they point to the AI skills that students need to maximize those benefits.

## Methodology

- 405 students aged 14–15 in UK secondary schools studied two text passages. Their comprehension and retention were assessed three days later.
- Group 1 studied one of the text passages using AI only and the other passage by taking notes. Group 2 used AI only on one text passage and a combination of AI and note-taking for the other passage.
- The study also explored students' learning experiences when using the different strategies, including which they preferred and why.
- Preliminary research findings: [Effects of generative AI and note-taking on reading comprehension and memory: A randomised experiment in secondary schools](#)
- Read more about [the latest AI in Education insights](#).

## Two Sides of the Story: Effectiveness vs. Enjoyment



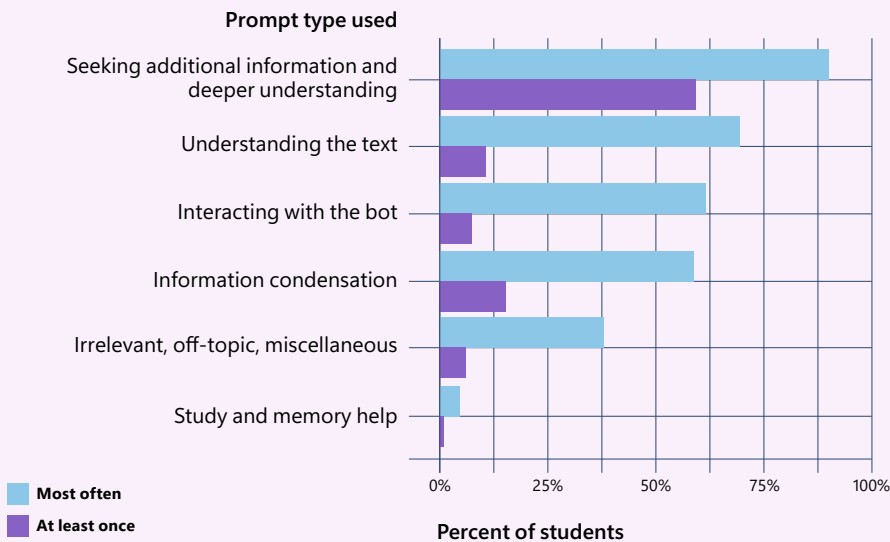
Effectiveness	Enjoyment
Note-taking—whether done alone or alongside AI use—produced higher comprehension and retention scores compared to using AI alone, underscoring the importance and effectiveness of traditional active learning strategies.	At the same time, students generally used AI constructively and perceived it as more enjoyable, more helpful, and preferable to note-taking.  Students preferred AI for its ability to answer questions, simplify complex material, and provide immediate feedback.

### The Takeaway:

- AI should be positioned as a complement—not a substitute—for established practices like note-taking, which remain essential for learning.
- By integrating AI thoughtfully with traditional methods, educators may achieve enhanced learning outcomes that neither approach can deliver alone.
- Leveraging input from educators and researchers in the design and use of new AI-based tools for learning is key to realizing these benefits.

## AI Provides New and Unique Learning Opportunities

The vast majority of students' AI use was constructive—seeking additional information and deeper understanding—rather than distracting or reductive.



Most students demonstrated remarkable curiosity, asking sophisticated questions that extended beyond the immediate text. These explorations represent a different kind of active learning opportunity that may not result from note-taking alone, underscoring AI's potential to expand intellectual horizons.

To foster this behavior, educators can:

- Actively encourage students to use AI productively, such as asking targeted questions that help them clarify specific misunderstandings, engage in critical thinking, and integrate information.
- Discourage students from using LLMs for passive consumption of automatic summaries and explanations.
- Leverage insights from students' interactions with AI to better understand what concepts they are struggling with or what they are curious about, and tailor future lessons and activities accordingly.