

## Highlights

- An experiment was conducted where K-12 students used AI chatbots to solve school-related problems.
- Two AI chatbot approaches were tested: one provided incremental guidance to encourage critical thinking (“Socratic”), while the other offered immediate solutions (“non-Socratic”).
- Results showed that AI-generated explanations improved students’ performance over solutions without them, highlighting the value of AI-generated guidance.
- Participants engaged more frequently with the Socratic AI, though this did not result in improved performance compared to the non-Socratic AI.
- While students found interactions with the AI useful, they perceived the Socratic AI as less helpful overall.
- The findings highlight challenges in designing AI tutors that effectively foster critical thinking while maintaining student satisfaction, raising concerns about their adoption in educational settings.