Facilitating Literature Review with Generative AI
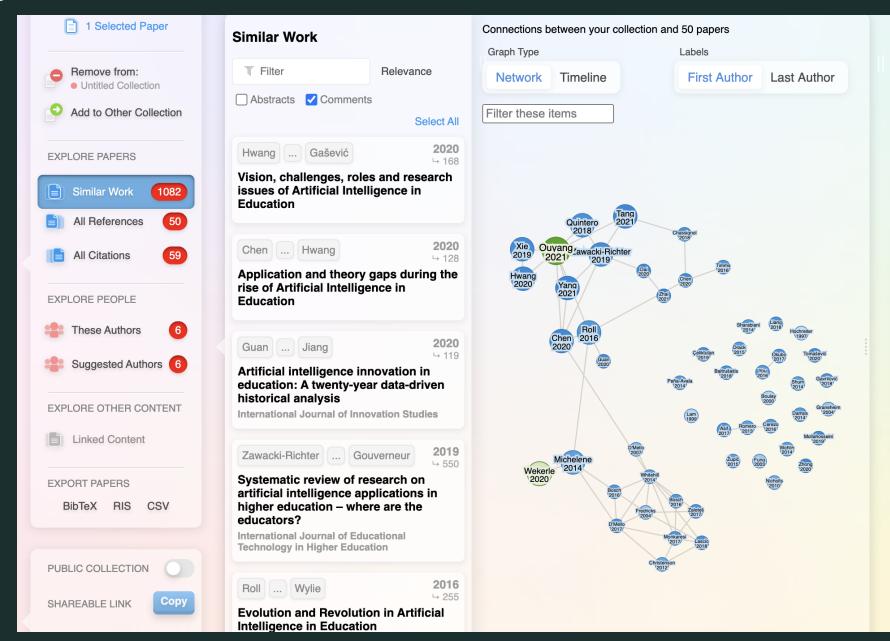
Dr. Chen Zhang

Agenda

- Generative AI Tools for literature review

- Practical Applications and Use Cases

- Challenges and Considerations

- Q&A

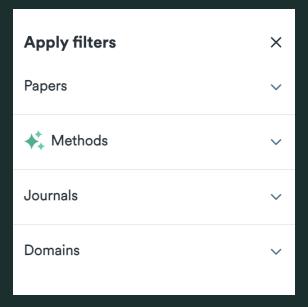# Generative AI Tools for Literature Review

	Scite (Assistant)	Elicit	Consensus (Copilot)	Scopus AI
Access & Fees	HKUST access (subscribed by library)	https://elicit.com (5000 free credits, life time)	https://consensus.app/ (20 credits per month for advanced AI features)	Currently on trial (till end of Mar 2024)
Role in assisting literature review	**AI chatbot** that can generate literature review with real citations in context	**AI research assistant** that can generate literature matrix and a review with real citations	**AI academic search engine** that can generate literature review with real citations	**AI feature add-on in Scopus** that can generate literature review with real citations from Scopus
Data sources for training the models	• Abstracts from Semantic Scholar (200M papers) • Full-text from OA articles • Citation statements from non-OA articles (under publisher agreements) • CrossRef	• Abstracts from Semantic Scholar (200M papers) • Full-text from OA articles	• Abstracts from Semantic Scholar (200M papers)	• Abstracts from Scopus (94M works)
Unique features	• Provide **context to citations**: supporting or contrasting or mentioning • Evidence from **non-OA articles** • **Extract original text** from papers for source verification	• **Literature matrix**, with self-defined info columns (e.g. sample size, population, study design)	• **"Search first, AI second"** • Label articles with study type, journal reputation, etc. • **Extract original text** from papers to answer the question • **"Consensus Meter"** for Yes/No questions to show distribution of supporting and contrasting evidence • **"Study Snapshot"** to extract sample size, population, etc.	• **Topic experts** (most productive authors in the field) • **Concept map** • **Foundational papers** (most cited relevant papers)

Zhao. Trust in AI: Evaluating Scite, Elicit, Consensus, and Scopus AI for Generating Literature Reviews. (n.d.). Retrieved from https://library.hkust.edu.hk/sc/trust-ai-lit-rev

Generative AI Tools

- Research Rabbit (Free Forever)

Consensus

Apply filters

Papers

✦ Methods

Journals

Domains

Clear all filters   2024-now

Summary   Beta
10 papers analyzed

These studies suggest that educational technologies can improve learning outcomes through enhanced problem-solving skills, language acquisition, engagement, and sustainable development practices, although the impact on information literacy skills may be low.

Consensus Meter   Beta
6 papers analyzed

☑ Yes - 83%
☑ Possibly - 0%
☑ No - 17%

🤖 Copilot   Beta
10 papers analyzed

Introduction

Educational technologies have been increasingly integrated into various learning environments, aiming to enhance learning outcomes. This synthesis examines the impact of different educational technologies on learning outcomes across various subjects and educational levels.

Key Insights

- **Mathematical Problem-Solving Improvement:**

Consensus

Copilot [Beta]

10 papers analyzed

Introduction

The integration of educational technologies in learning environments has been a topic of significant interest and investment. Researchers have explored various forms of technology, such as digital tools, intelligent systems, and immersive technologies, to determine their impact on learning outcomes. This synthesis aims to present the key insights from multiple studies on whether educational technologies can improve learning outcomes.
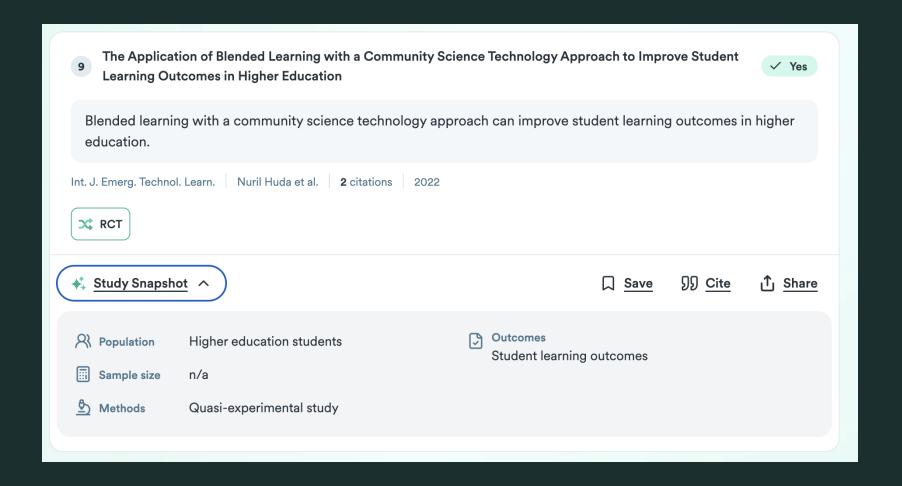
Key Insights

How features of educational technology applications affect student reading outcomes: A meta-analysis

Educational Research Review | A. Cheung et al.

- **Positive Impact on Specific Subjects and Age Gro**

  - Educational technologies show promising resu... ...g ... ...e mathematics and reading for young children, but not as much for other subjects or older children [1] [3] [4] .

- **Blended Learning and Personalized Approaches:**

  - Blended learning, which combines traditional and digital methods, can enhance learning outcomes by providing self-paced learning and personalized feedback [2] [8] [9] .

  - Personalized learning technologies that adapt to individual student levels show significant positive effects, especially in low- and middle-income countries [8] .

Consensus

9 · The Application of Blended Learning with a Community Science Technology Approach to Improve Student Learning Outcomes in Higher Education ✓ Yes

Blended learning with a community science technology approach can improve student learning outcomes in higher education.

Int. J. Emerg. Technol. Learn. | Nuril Huda et al. | **2** citations | 2022

⤬ RCT

✦ Study Snapshot ⌃   🔖 Save   ❞ Cite   ⬆ Share

👥 **Population**   Higher education students   📄 **Outcomes**
                                                            Student learning outcomes
🔢 **Sample size**   n/a

🔬 **Methods**   Quasi-experimental study

Generative AI Tools

- ChatGPT – 4o ("Free")

Feature	ChatGPT-3.5	ChatGPT-4	ChatGPT-4 Optimal (4O)
Release Date	September 2022	March 2023	June 2023
Model Size	6 billion parameters	8 billion parameters	Same as ChatGPT-4
Training Data Cut-Off	2021	2022	Same as ChatGPT-4
Performance	Good	Better, more nuanced	Optimized for speed
Understanding Complex Queries	Adequate	Improved	Same as ChatGPT-4
Handling Nuanced Conversations	Moderate	Excellent	Same as ChatGPT-4
Speed and Efficiency	Standard for its size	Standard for its size	Enhanced speed
Use Cases	General chat, simple tasks	More complex tasks, nuanced dialogues	High-efficiency environments requiring fast responses
Multimodal Capabilities	Text only	Text and images	Text and images
Error Rate	Higher	Lower	Lowest among the three
Customizability	Limited	More flexible	Same as ChatGPT-4
Cost to Use	Lower	Higher	Highest due to efficiency

Practical Applications with ChatGPT 4o+Consensus Plugin

- Integrated Experience

- Immediate Assistance

- Enhanced Contextual Understanding

- Customized Responses

Use Cases

- Research Niche/Question

- Literature Review

- Research Design

- Data Analysis

- Presentation

Considerations and Guidelines

- Researchers should remain ultimately responsible for scientific output.

- Researchers should use generative AI transparently.

- Researchers should pay particular attention to issues related to privacy, confidentiality, and intellectual property rights when sharing sensitive or protected information with AI tools.

- Researchers should refrain from using generative AI tools substantially in sensitive activities that could impact other researchers or organizations.

Directorate-General for Research and Innovation. (2024). Guidelines on the responsible use of generative AI in research developed by the European Research Area Forum. Accessed: https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/guidelines-responsible-use-generative-ai-research-developed-european-research-area-forum-2024-03-20_en

Thanks for your attention!

Q&A