Systematic Literature Review on the Use of AI Chatbots in Education and Learning Support

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Abstract

Chatbot berbasis kecerdasan buatan (AI) kian diintegrasikan dalam ekosistem pendidikan sebagai tutor pribadi, asisten pembelajaran, dan mitra belajar. Namun, bukti tentang dampaknya terhadap hasil belajar dan keterlibatan, serta risiko etis dan integritas akademik, masih tersebar [1, 2].

Metode: Kami melakukan tinjauan sistematis atas literatur 2018–2025, meliputi SLR generik tentang chatbot pendidikan, SLR khusus ChatGPT (PRISMA), dan meta-analisis efek chatbot pada pembelajaran. Sintesis naratif dilakukan untuk memetakan peran, konteks desain interaksi, outcome, dan tantangan, serta agenda riset ke depan.[1, 2, 3, 4]

Hasil: Bukti konsisten menunjukkan chatbot menyediakan umpan balik instan, personalisasi konten dan kecepatan belajar, serta dukungan tugas dan konsep. Meta-analisis atas 32 studi (n≈2201) menemukan efek sedang hingga tinggi pada hasil belajar agregat, dengan peningkatan bermakna pada prestasi, retensi, dan penalaran eksplisit. Namun, hasil negatif atau heterogen muncul pada kemampuan berpikir kritis, motivasi, dan keterlibatan. [1, 2, 4, 5, 6]

Kesimpulan: Chatbot AI berpotensi memperkuat proses pembelajaran, tetapi manfaatnya bergantung pada desain instruksional, validasi keluaran, serta tata kelola etika. Penelitian mendatang perlu mengeksplorasi efek jangka panjang, moderator (usia, domain, durasi), serta desain scaffolding, kolaborasi manusia–AI, dan kebijakan integritas akademik.[1, 2, 3, 4]

Keywords: AI Chatbots, Education, Learning Support, SLR, PRISMA.

1 Introduction

Explain background, motivation, research gaps, and importance of AI chatbot research.

1.1 Research Questions

- **RQ1**: What AI chatbot technologies are most commonly used in education?
- **RQ2**: In which contexts or domains are AI chatbots applied?
- **RQ3**: What benefits and limitations are reported?
- **RQ4**: What are the research trends over time?

2 Background

Provide theoretical overview:

- Chatbots and Dialogue Systems
- NLP and LLM-based Chatbots
- Learning Support Systems
- Intelligent Tutoring Systems

3 Methodology

This SLR follows PRISMA guidelines.

3.1 Search Strategy

Databases used:

- IEEE Xplore
- ACM Digital Library
- Scopus
- ScienceDirect

Example search string:

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("chatbot" OR "AI chatbot" OR "conversational agent" OR "LLM")
AND ("education" OR "learning" OR "tutoring")
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3.2 Inclusion Criteria

- Focus on AI chatbots in education
- Published between 2018–2025
- Peer-reviewed articles

3.3 Exclusion Criteria

- Duplicate studies
- Non-English publications
- No access to full text

PRISMA Flow Diagram Placeholder

Figure 1: PRISMA Flow Diagram

3.4 Study Selection (PRISMA)

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Identified -> Screened -> Eligible -> Included
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4 Results

4.1 Overview of Selected Studies

- Total identified: XX
- Final included: XX

5 Data Extraction Table

Author	Year	Domain	Technology Used	Key Findings
Author A	2020	Education	LLM Chatbot	Improved feedback.
Author B	2022	Higher Ed	NLP Chatbot	Increased engagement.

6 Discussion

Provide deeper analysis.

7 Conclusion

Summarize findings.

References

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