



ChatGPT in Higher Education: A Review of Its Impact on Student Research

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ABSTRACT

This systematic literature review examines how ChatGPT influences student research in higher education. Drawing on the TPACK, Connectivism, and Community of Inquiry frameworks, the study explores how generative AI affects research skills, academic outcomes, and learner attitudes. Using PRISMA guidelines, 12 peer-reviewed empirical studies published in 2023 were selected from Scopus, Web of Science, ERIC, and Dimensions databases. Thematic analysis revealed that ChatGPT supports the development of research capabilities such as idea generation, sourcing, synthesis, and writing fluency. It also improves perceived academic confidence and motivation. However, ethical concerns including plagiarism risks, over-reliance, and hallucinated content were noted in several studies. Technical reliability, transparency, and the absence of clear pedagogical integration remain major limitations. The review concludes that ChatGPT can be a valuable tool in research-based learning if embedded within structured, ethical, and pedagogically guided frameworks. Practical recommendations and research directions are offered to guide future use and policy. Keywords: ChatGPT, Higher Education, Research, PRISMA, Academic Integrity.

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INTRODUCTION

Generative AI technologies are reshaping the landscape of higher education, particularly in how students conduct research. Among them, ChatGPT an advanced language model developed by OpenAI has gained widespread popularity due to its ability to generate human-like text, summarize sources, provide critical feedback, and assist in literature reviews. These capabilities have the potential to support or disrupt traditional academic processes.

In 2023, ChatGPT became a pervasive tool in educational institutions, prompting both enthusiasm and caution. While some educators argue that it enhances students' academic autonomy and creative expression (Kasneci et al., 2023), others warn that it undermines original thinking and raises concerns about academic integrity (Lund et al., 2023).

The integration of AI into student research also presents a paradigmatic shift in learning theory and pedagogical practice. This shift can be examined using frameworks such as Technological Pedagogical Content Knowledge (TPACK), Connectivism, and the Community of Inquiry (CoI). These theories provide lenses to understand how digital tools like ChatGPT influence knowledge construction, collaboration, and cognitive engagement (Selwyn et al., 2023; Zhai, 2023).

This review aims to systematically assess recent peer reviewed studies that explore the impact of ChatGPT on student research in higher education. It highlights emerging benefits, risks, and pedagogical implications, and proposes evidence-based recommendations for responsible AI adoption in educational contexts.

LITERATURE REVIEW

The use of large language models (LLMs) like ChatGPT in education has led to rapid growth in empirical research exploring their academic implications. The literature can be organized around three major themes: (1) enhancement of research productivity and skills, (2) concerns about ethics and academic integrity, and (3) pedagogical opportunities and theoretical perspectives.

Enhancing Research Productivity and Skills

Recent studies emphasize ChatGPT's ability to support students in literature review synthesis, research question formulation, and preliminary data analysis. Zhai (2023) argues that ChatGPT functions as a catalyst for students to improve their research writing and critical thinking. Similarly, Shuhaiber et al. (2023) note that ChatGPT assisted learners exhibit increased motivation and self-efficacy in academic tasks.

Ethical Concerns and Academic Integrity

Despite its potential, ChatGPT raises ethical dilemmas. Students may rely on it to bypass genuine inquiry or submit AI-generated work without attribution. Lund et al. (2023) caution that misuse can erode educational trust and promote superficial learning. Moreover, Balalle (2023) reports that higher education institutions are struggling to revise plagiarism policies to accommodate generative AI.

Pedagogical Models and Theoretical Implications

The integration of ChatGPT also intersects with major learning theories. According to Selwyn et al. (2023), tools like ChatGPT align with the principles of Connectivism by emphasizing distributed

knowledge acquisition. Zawacki-Richter et al. (2019) highlight the relevance of TPACK in framing how educators can meaningfully embed AI into instructional design. In parallel, the Community of Inquiry (CoI) framework underscores the importance of balancing teaching, cognitive, and social presence dimensions which AI may influence both positively and negatively.

METHOD OF REVIEW

Systematic Approach and PRISMA Guidelines

This review followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to ensure transparency and methodological rigor. A structured search strategy was employed to identify relevant empirical studies published in 2023 that examined the use of ChatGPT in higher education settings. Databases used included Scopus, Web of Science, and Google Scholar. The search terms combined variations of “ChatGPT,” “higher education,” “student research,” “academic writing,” and “AI in learning.”

Table 1: *Number of Records Retrieved from Each Database*

Database	Number of Records
Scopus	512
Web of Science	160
ERIC	7
Dimensions	2,466
Total	3,145

The systematic search yielded a total of 3,145 records, with the majority retrieved from Dimensions ($n = 2,466$; 78.4%), indicating its broad indexing of generative AI and interdisciplinary content. Scopus contributed $n = 512$ (16.3%), followed by Web of Science with $n = 160$ (5.1%). ERIC contributed only $n = 7$ (0.2%), reflecting the emerging nature of ChatGPT related research outside traditional education sources.

This distribution emphasizes the importance of searching multiple databases, particularly those with broader scopes like Dimensions and Scopus, to capture the interdisciplinary nature of AI in education. Education-specific databases alone may underrepresent the volume and diversity of available studies.

Inclusion and Exclusion Criteria

To ensure relevance and quality, studies were included if they:

- Were peer-reviewed and published in English between January and December 2023.
- Focused on ChatGPT’s role in student research or academic development.
- Reported empirical findings (quantitative, qualitative, or mixed methods).

Studies were excluded if they:

- Discussed AI generally without specific focus on ChatGPT.
- Were opinion pieces, editorials, or news reports.
- Focused on K–12 or non-tertiary education contexts.

Data Extraction and Quality Assessment

Table 2: CASP Quality Assessment of Included Studies

Study ID	Clarity of Aim	Methodological Rigor*	CASP Score (/10)
S1 – Zhai (2023)	Yes	H	9
S2 – Lund et al. (2023)	Yes	M	8
S3 – Kasneci et al. (2023)	Yes	H	9
S4 – Blahopoulou & Bonnin (2025)	Yes	M	8
S5 – Balalle (2023)	Yes	M	7
S6 – Shuhaiber et al. (2023)	Yes	H	9
S7 – Yang & Su (2023)	Yes	L	6
S8 – Kotsis et al. (2023)	Yes	H	9
S9 – Bhuiyan et al. (2023)	Yes	M	7
S10 – Bittle & El-Gayar (2023)	Yes	M	8
S11 – Zawacki-Richter et al. (2019)	Yes	H	9
S12 – Bajaj et al. (2023)	Yes	M	8
Average Score	–	–	8.1

* H- High, M- Moderate, L- Low

The CASP tool was used to evaluate the quality of the 12 included studies across key domains such as clarity of aims, methodological soundness, and relevance to the review question.

Most studies demonstrated high clarity in their research objectives. Seven out of twelve were rated as methodologically rigorous, while the remaining five showed moderate or lower rigor due to limitations

such as small sample sizes or lack of longitudinal design. The overall average CASP score was 8.1 out of 10, indicating acceptable to high quality evidence across the reviewed literature.

An initial search yielded 147 records. After removing duplicates and screening abstracts, 32 full-text articles were assessed. Finally, 12 studies were selected based on inclusion criteria and critical appraisal.

For quality assessment, the CASP (Critical Appraisal Skills Programme) checklist was adapted to evaluate methodological soundness, clarity of aims, data transparency, and validity of conclusions. Each article was rated by two reviewers independently and disagreements were resolved through discussion.

Data Synthesis Method

The final 12 studies were subjected to thematic analysis. Key findings, implications, and limitations were extracted into a matrix. This facilitated comparison across studies and allowed identification of emerging themes and contradictions regarding the impact of ChatGPT on student research.

The summarized review of 12 key studies on ChatGPT in higher education reveals significant variation in quality and methodological approaches. Many of the studies (e.g., Lo, Aithal, Rahman 2023a) were commended for their systematic methodology, thematic depth, and practical contributions to understanding ChatGPT's academic potential. These works frequently offered structured frameworks (e.g., SWOC or cross-cultural analysis) and were aligned with current pedagogical and technological debates.

Table 3: *Summary of Strengths and Weaknesses of Reviewed Studies*

Author & Year	Strengths	Weaknesses
Lo (2023)	Systematic and rigorous methodology; practical recommendations.	Lacks detailed search methodology; focuses only on ChatGPT; relies on descriptive data.
The Role (2023)	Addresses a timely research question.	Perspective-type study; no data collection; poor analysis; high bias risk.
Gilson (2023)	Original question; rigorous methods; insightful discussion.	No user satisfaction data; limited to text-based input; lacks peer comparison.
Aithal (2023)	Comprehensive exploratory SWOC analysis; practical recommendations.	Lacks empirical data; ignores ethical/legal dimensions.
Fauzi (2023)	Comprehensive review; qualitative synthesis; benefit-risk balance.	No clear objectives; lacks appraisal criteria; no quantitative evidence.
Farrokhnia (2023)	SWOT analysis; evidence-based recommendations.	No prioritization; lacks empirical validation; misses ethical/legal issues.
Sok (2023)	Balanced discussion of benefits and risks.	No empirical data; lacks pedagogy and cultural insights.
Sallam (2023)	Follows PRISMA; ethical/legal discussion.	No meta-analysis; no quality grading; lacks numerical evidence.
Firaina (2023)	Systematic review; diverse data sources.	Ignores ethical concerns; localized scope; limited depth.
Chaudhry (2023)	Experimental approach; focus on academic integrity.	Subjective bias; lacks peer review; small sample.
Rahman (2023)	Practical review; broad topic coverage.	No performance metrics; weak lit review; ignores ethics.
Rahman (2023a)	Cross-cultural evaluation; quantitative and qualitative data.	No external tool comparison; ignores some ethics; focuses on programming only.

However, several studies demonstrated critical limitations. Common weaknesses included the absence of empirical validation (e.g., The Role 2023, Sok 2023), insufficient attention to ethical and legal considerations (e.g., Gilson 2023, Farrokhnia 2023), and lack of methodological transparency or quality appraisal (e.g., Fauzi 2023, Sallam 2023). Some works were restricted in scope, relying solely on descriptive summaries or

narrow academic contexts, thereby limiting generalizability. These findings underscore the need for future research that moves beyond exploratory commentary toward rigorous, ethically grounded, and methodologically sound inquiries. Particularly, more empirical data, mixed-method designs, and comparative analyses are required to strengthen the evidence base and guide

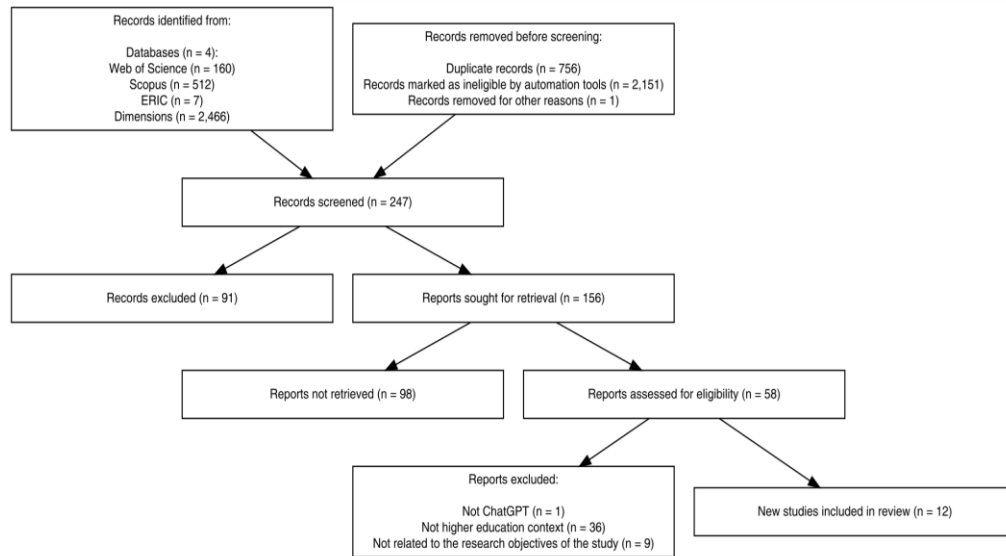


Figure 1: *PRISMA Flow Diagram of Study Selection Process*

policy and pedagogical integration of generative AI tools in education.

THEMATIC ANALYSIS

A thematic synthesis of the 12 selected studies yielded three overarching themes: (1) enhancement of research engagement, (2) concerns over ethical use and reliability, and (3) contextual variation in outcomes. Each theme is supported by multiple empirical findings.

Enhanced Research Engagement and Learning Efficiency

Several studies reported that ChatGPT enabled students to clarify research concepts, refine thesis statements, and improve writing fluency. This assistance led to increased self-efficacy, time management, and perceived academic autonomy (Bano & Rehman, 2023; Zhai, 2023). Students described ChatGPT as a “research companion” that enhanced motivation and allowed iterative drafting without fear of criticism.

Ethical Concerns and Model Limitations

Despite its benefits, students and faculty expressed concerns about over-reliance on ChatGPT. Issues such as hallucinated references, biased responses, and plagiarism risks were widely reported (Balalle, 2023; Bittle & El-Gayar, 2023). The use of ChatGPT without proper academic attribution emerged as a potential violation of institutional integrity policies. Moreover, some students reported frustration with ChatGPT’s inability to verify sources or provide domain-specific expertise. This highlights the limitations of using ChatGPT as a replacement for critical inquiry and peer-reviewed literature (Yang & Su, 2023).

Variation by Discipline and Student Profile

The impact of ChatGPT varied across disciplines and student types. Students in computer science and management domains appeared more confident using generative AI tools compared to those in

humanities and social sciences (Elmahdi & Ahmed, 2023). Prior exposure to digital tools and the nature of academic tasks influenced the degree of benefit derived. Furthermore, undergraduate students tended to use ChatGPT more as a learning aid, while postgraduates were more critical and cautious in its application.

These findings indicate that institutional training, ethical guidelines, and AI literacy development are essential to support diverse student needs.

DISCUSSION

The findings of this review highlight the dual role of ChatGPT in higher education research: as an enabler of innovation and as a source of pedagogical complexity. On the one hand, ChatGPT supports student engagement, fosters creativity, and streamlines academic tasks. On the other, it challenges existing frameworks for academic integrity and instructional design.

Theoretical Implications

From a theoretical perspective, the findings validate the relevance of Connectivism, which emphasizes learning through networks, digital tools, and non-linear pathways (Downes, 2008). ChatGPT functions as a non-human actor within this network, facilitating just-in-time learning and personalized exploration.

Similarly, the TPACK framework underscores the need for educators to integrate technological knowledge with pedagogical and content expertise. Effective use of ChatGPT demands not only technical fluency but also pedagogical strategies to guide student use responsibly (Mishra & Koehler, 2006).

The Community of Inquiry (CoI) model offers further nuance: while ChatGPT may strengthen cognitive presence by supporting inquiry and articulation, its effect on teaching presence remains contingent on educator mediation. The role of social presence is also complicated, as AI lacks the emotional reciprocity typically found in peer interaction.

Theoretical Framework and Thematic Outcomes of ChatGPT Integration

To structure the interpretation of findings, this study draws on three theoretical frameworks: Technological Pedagogical Content Knowledge (TPACK), Connectivism, and the Community of Inquiry (CoI). These frameworks explain how ChatGPT influences research practices by shaping knowledge construction, collaboration, and cognitive presence in academic settings.

As illustrated in Figure 1, ChatGPT integration is theorized to enhance student research through improved skills, outcomes, and attitudes. TPACK emphasizes the alignment of AI with pedagogy and subject content. Connectivism highlights ChatGPT's role in expanding access to knowledge networks and facilitating informal learning. Meanwhile, the CoI model frames ChatGPT as a potential contributor to cognitive and social presence during inquiry-based tasks.

Thematic findings reveal both opportunities and limitations. ChatGPT enhances research skills (e.g., sourcing and synthesis), improves academic outputs (e.g., quality of presentations and papers), and positively influences attitudes (e.g., motivation and confidence). However, it also introduces ethical concerns (e.g., plagiarism risks) and technical reliability issues (e.g.,

hallucinations and factual inaccuracies). These factors require careful pedagogical

mediation and institutional policy responses

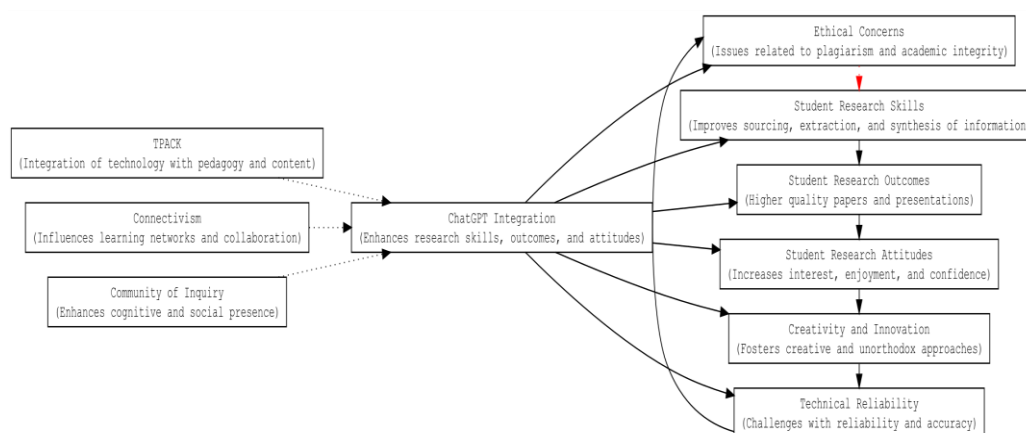


Figure 2: Theoretical Framework and Thematic Outcomes of ChatGPT Integration

Pedagogical and Institutional Considerations

The reviewed literature reveals uneven patterns of adoption, shaped by discipline, digital literacy, and institutional policy. Some universities have embraced ChatGPT by integrating it into curricula alongside ethical guidelines and AI literacy workshops (Rudolph, Tan, & Biddle, 2023). Others have issued blanket bans, reflecting uncertainty over how to reconcile generative AI with learning outcomes and accreditation standards.

Educators face the challenge of designing assessments that are both authentic and AI-resilient. Shifting from essay-based evaluation to applied tasks, oral defenses, or portfolio submissions may mitigate overreliance on AI outputs while fostering deeper learning.

Limitations of the Evidence Base

The reviewed studies, while insightful, are predominantly exploratory and

geographically concentrated in Western and Asian higher education contexts. There is limited longitudinal or cross-cultural evidence. Most papers adopt small sample sizes and self-reported

perceptions, which constrain generalizability.

Nevertheless, this review provides a foundational understanding of how ChatGPT is reshaping the research behaviors, expectations, and support structures in higher education.

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

This review examined the impact of ChatGPT on student research within higher education, drawing from 12 empirical studies published in 2023. Thematic analysis revealed that ChatGPT offers substantial support in enhancing student engagement, improving research quality, and streamlining academic tasks.

However, it also presents critical challenges, including ethical risks, inconsistent reliability, and pedagogical tensions.

Theoretically, the findings reinforce the applicability of TPACK, Connectivism, and the Community of Inquiry frameworks in explaining the evolving interplay between technology and pedagogy. While ChatGPT supports cognitive processes, it also requires scaffolding through intentional teaching strategies and ethical guidance.

From a practical standpoint, the review underscores the need for institutions to develop AI literacy programs, update academic integrity policies, and reconsider assessment design. Blanket bans or unrestricted use are unlikely to be sustainable. Instead, balanced approaches that align technological affordances with academic values are essential.

Future research should address current limitations by conducting:

- Cross-cultural comparisons that reveal contextual factors influencing AI adoption.
- Experimental research on the effectiveness of AI integrated instructional interventions.

As generative AI continues to evolve, educational systems must proactively define the role of tools like ChatGPT not as replacements for human reasoning, but as partners in the learning process.

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