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Delving into Chit-Chat with GPT-3.5: Holy Grail or Pandora's Box? A Review of AI Opportunities and Challenges in Academia

Norbert Griszbacher

BT Hungary

 ORCID: <https://orcid.org/0000-0003-3682-520X>

Abstract

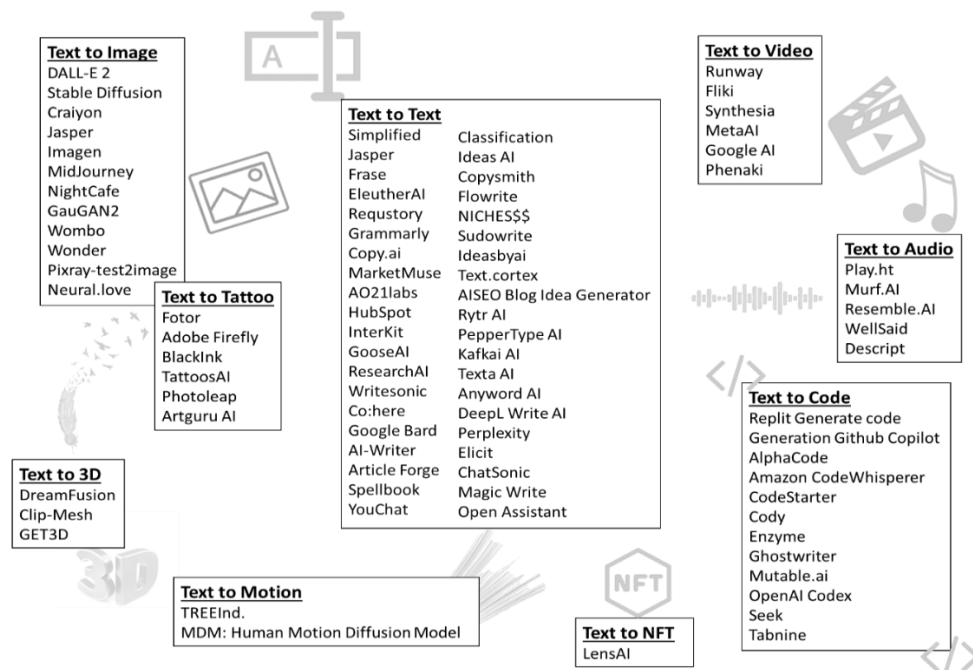
In recent history, technological progress has continually reshaped various aspects of our lives. One notable advancement is the emergence of ChatGPT, an advanced AI-based chatbot that has significantly impacted industries and daily routines. Particularly in education, ChatGPT has ushered in new possibilities for students, teachers, and researchers, offering advanced capabilities in tasks ranging from class preparation to paper writing. However, as a new phenomenon, it came with challenges within an unexplored grey area, introducing certain threats that persist even after more than a year into the ChatGPT journey (e.g., bias, privacy, plagiarism, misuse, and abuse). This systematic literature review (SLR) aims to explore the opportunities and threats associated with ChatGPT's use in academia, drawing insights from 26 selected papers. The findings suggest that the currently available ChatGPT version (3.5) holds promise by augmenting human knowledge and streamlining processes for students, teachers, and researchers, provided its limitations are addressed effectively. Considering the existing constraints of ChatGPT and our understanding, its current utility is primarily limited to routine tasks like data mining, idea generation and language editing, serving as an assistant where human expertise, judgment, and creativity are indispensable and irreplaceable. However, understanding the ethical and effective use of AI in academic settings remains a challenge, necessitating further research, especially comparative and longitudinal studies. The paper concludes with a discussion section that provides valuable insights for future discourse, emphasising practical and theoretical considerations. Despite the present challenges, the inevitable integration of AI into academia requires proactive collaboration among academic and business stakeholders to dispel current myths and implement necessary policies for successful human-AI collaboration. It is essential to recognise that our world is evolving, and upcoming generations will inevitably engage with AI. This calls for cultural shifts, mindset changes, and skill enhancements, particularly in creativity and critical thinking abilities.

Keywords: AI, ChatGPT, academia, education, research, human-AI collaboration, future skills

1. Introduction: It's 2024, and We're still Chatting about ChatGPT

Throughout history, transformative innovations have emerged, reshaping our world across social, economic, and environmental dimensions, propelled by rapid technological progress and global interconnectedness (Mhlanga, 2023). Recent inventions, exemplified by Internet-era platforms like Facebook, Uber, Airbnb, Spotify, Tinder, and TikTok, have significantly impacted the quality of life, especially for the tech-savvy younger generations. Just a short while ago, the unveiling of the next groundbreaking tool was heralded by George and George (2023, p. 9): “*What will be the next definitive moment in history. It's here, and it's called Chat GPT.*” Experts argue that amidst a landscape of technological advancements reshaping human existence daily, one revolutionary force stands out: Artificial Intelligence (AI) (Adiguzel et al., 2023; Bahroun et al., 2023; Lim et al., 2023). Established in 2015, the OpenAI research lab, supported by notable backers including Elon Musk and Microsoft, garnered significant investments for exclusive access to its products. In November 2022, OpenAI launched ChatGPT, quickly gaining widespread usage and attracting one million users in just five days. To provide context, Facebook took 300 days, Twitter 720 days, and Instagram 75 days to reach the same milestone (Bahroun et al., 2023; Birenbaum, 2023; Biswas, 2023c; Farrokhnia et al., 2023; Firat, 2023; Lim et al., 2023; Lo, 2023; Rudolph et al., 2023). While companies like Google and Meta had already introduced chatbot technologies, ChatGPT gained prominence due to its public accessibility, user-friendly interface, and the provision of (mostly) credible, real-time responses (Aydın & Karaarslan, 2023; Dwivedi et al., 2023).

FIGURE 1. AN OVERVIEW OF THE MOST POPULAR TEXT-BASED AI TOOLS



Source: own compilation based on Aydın and Karaarslan (2023, p. 120) and Ray (2023, p. 135)

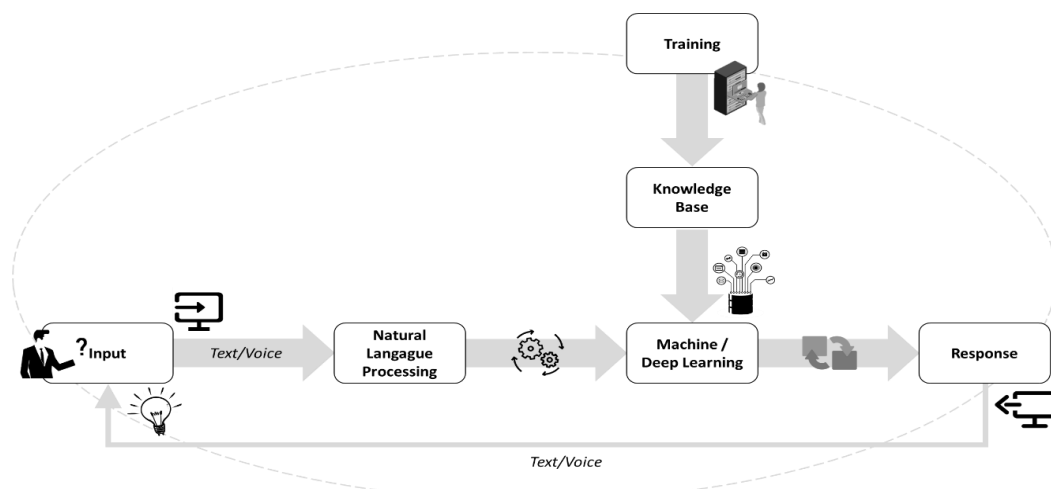
Among the various text-based AIs shown in Figure 1, ChatGPT maintains a leading position due to its advanced capabilities for handling complex tasks (for a detailed comparison, see Aydın and Karaarslan (2023) and Ray (2023)). With the rising popularity and utilisation of AI-based tools like ChatGPT, comprehending the challenges and opportunities within AIs becomes crucial. The significance of grasping this subject is heightened by the continual digital transformation of industries, the empowerment of (internet) users, and the escalating demand for seamless and personalised experiences. Despite the increasing number of studies in this

domain, our comprehension of this area remains restricted. This implies that the existing challenges, as well as ethical considerations for the fair use of AIs, are yet to be fully discerned. Therefore, this study aims to conduct a comprehensive review of current themes surrounding ChatGPT, shedding light on both present and future avenues for innovation. The paper is organised as follows: (1) Introduction – exploring the innovation of ChatGPT; (2) ChatGPT-3.5 Unveiled – providing a brief summary of ChatGPT; (3) Systematic Literature Review – outlining the methods, design and findings of the review; (4) Discussion and Conclusions – presenting key findings, future implications, and suggested research directions.

2. ChatGPT-3.5 Unveiled: Decoding the Wizard Behind the Textual Curtain

The Generative Pre-trained Transformer (GPT) functions as an AI chatbot, proficient in swiftly generating comprehensive responses to prompts and inquiries using large language models (LLM). Leveraging advancements in natural language processing (NLP), machine learning, and deep learning (ML and DL), generative AI (GAI) creates artificial content by analysing various digital training examples, including video, images, text, and audio. While initial user feedback for early ChatGPT responses varied, subsequent updates have significantly improved user satisfaction. This open-source chatbot employs advanced guided and reinforcement learning techniques, utilising user feedback through upvotes, downvotes, and textual input to refine its responses. Users can also prompt ChatGPT to regenerate responses, facilitating the search for suitable alternatives (AlAfnan et al., 2023; Aydın & Karaarslan, 2023; Rahman & Watanobe, 2023; Ray, 2023; Rudolph et al., 2023; Tlili et al., 2023). Although initially available for free, OpenAI has transitioned to a subscription-based model for ChatGPT-4 (ChatGPT Plus), priced at \$20 per month (OpenAI, 2023). Despite a considerable number of subscribers to the premium version, the majority still relies on the free version (3.5), which offers sufficient capabilities for many users. ChatGPT’s popularity stems from its potential to transform human interaction with technology, providing a seamless, natural conversation experience based on precise algorithms and extensive data analysis (Figure 2). Moreover, with its understanding of context, intent, sentiment, and more, ChatGPT enables users of diverse backgrounds, ages, and education levels to communicate naturally in multiple languages without requiring in-depth language, programming, or computer science knowledge.

FIGURE 2. THE WAY CHATBOTS CURRENTLY OPERATE



Source: own compilation based on Adiguzel et al. (2023), Gill and Kaur (2023), and Rathore (2023)

With all these strengths, ChatGPT is anticipated to greatly impact society. Its remarkable versatility and widespread relevance, coupled with its free accessibility (GPT-3.5, at least when the status is not “*at capacity right now*”, as noted by Thorp (2023, p. 313) and Rudolph et al. (2023, p. 345)), suggest potential applications across diverse sectors beyond the initial customer service domain (Dwivedi et al., 2023; George & George, 2023; Gill & Kaur, 2023; Rathore, 2023; Ray, 2023). These include economics, finance, banking, legal services, healthcare, sales, marketing, media, entertainment, creative writing, content generation, as well as art (Guo et al., 2023), military (Biswas, 2023b), and even climate change initiatives (Biswas, 2023a). It is evident that various potential applications exist, with education and research emerging as the most frequently discussed fields (Adiguzel et al., 2023; AlAfnan et al., 2023; Baidoo-Anu & Owusu Ansah, 2023; Birenbaum, 2023; Biswas, 2023c; Cotton et al., 2023; Dwivedi et al., 2023; Farrokhnia et al., 2023; Firat, 2023; Kasneci et al., 2023; Kooli, 2023; Mhlanga, 2023; Rahman et al., 2023; Rahman & Watanobe, 2023; Shidiq, 2023; Tlili et al., 2023 among others).

Despite its global embrace, just like all innovations, AIs like ChatGPT seem to have dual facets: while they present various opportunities, scholars harbour ambivalent sentiments regarding their “*Doomsday*” and “*Ragnarök*” (end of the world) implications (Baidoo-Anu & Owusu Ansah, 2023; Barrett & Pack, 2023; Birenbaum, 2023; Chan, 2023; Cotton et al., 2023; Dwivedi et al., 2023; Farrokhnia et al., 2023; Lim et al., 2023; Mhlanga, 2023; Rudolph et al., 2023; Thorp, 2023; Tlili et al., 2023). A significant concern with the current ChatGPT version is its training on a vast dataset from various sources, which raises the issue that there is no identifiable source whose work may be unintentionally replicated by the chatbot when trying to generate authentic real-time responses. Adding complexity, OpenAI’s Terms of Use state that users are granted “*all its right, title, and interest in and to Output*” from ChatGPT, including for publication purposes (Barrett & Pack, 2023, p. 2). However, users are cautioned that “*ChatGPT can make mistakes. Consider checking important information*” and “*ChatGPT sometimes writes plausible-sounding but incorrect or nonsensical answers*” (Thorp, 2023, p. 313), thereby transferring (more or less) the responsibility to the human users, who might lack complete awareness of the origin (and consequently, the reliability) of the utilised data and the possible threat hidden within the lines (see earlier trial errors demonstrated by Aydın and Karaarslan (2023), Birenbaum, (2023), Dwivedi et al. (2023), Halaweh, (2023), Lim et al. (2023), Rahman et al. (2023), Tili et al. (2023)). One of the biggest concerns is that responses to the very same prompt can vary in relevancy, design, and focus, leading to disparities among users (Dwivedi et al., 2023; Tili et al., 2023). Trained on internet data, ChatGPT may also perpetuate biases and contribute to misinformation, which is evident in instances of discriminatory output. Given that a massive portion of the training data may originate from a predominantly white, male, Western, English-speaking perspective, it is likely that the data would be heavily skewed to reflect those structures (Dwivedi et al., 2023). While users of chatbots may gain unfair advantages, variations exist. Gerritsen (2023) notes these challenges are amplified when interacting with ‘special users’ like younger individuals: AIs relying on limited data sources (often including sites like TikTok, Twitter or Facebook) may struggle with consistency, especially in educational settings. Understanding nuanced expectations from these individuals adds complexity to the AI’s comprehension, raising concerns about unpredictable actions, like penalising students for using innocent words like ‘unicorn.’

As presented, content creation with AI is a relatively uncharted territory; it resides within a grey area where further (ethical) challenges and responsible practices may come into question, leading some to perceive it as a disruptive, evil technology. Firat (2023) highlighted that the basic human resistance to change primarily fuels this perspective, reflecting apprehensions about its transformative potential rather than its disruptive essence. Dwivedi et al. (2023, p. 4) contributed to the discourse by emphasising that the disruptive aspect does not inherently imply

a negative connotation, as they state, “(...) *it has happened suddenly and quickly. Technology, by its very nature, does evolve. Sometimes, it is disruptive.*” As also emphasised by Rudolph et al. (2023, p. 343), it is “*not particularly evil,*” ultimately dependent on how humans utilise it, much like any inanimate object. These concepts collectively contribute to various paradoxes surrounding AIs like ChatGPT, exemplifying an extraordinary situation where it can be considered a “*friend yet a foe*” (Lim et al., 2023, p. 1). As demonstrated by the preceding examples, given the significant tension within the field of education, there is a need for a critical discourse that can effectively navigate both the concerns and excitement surrounding generative AIs in a balanced manner (Lim et al., 2023). Drawing from these mixed sentiments, the following research questions were formulated, forming the foundation of this research paper:

RQ1: What opportunities and challenges exist for various stakeholders in academia?

RQ2: Is ChatGPT, and similar AIs, truly disruptive (in an evil manner)?

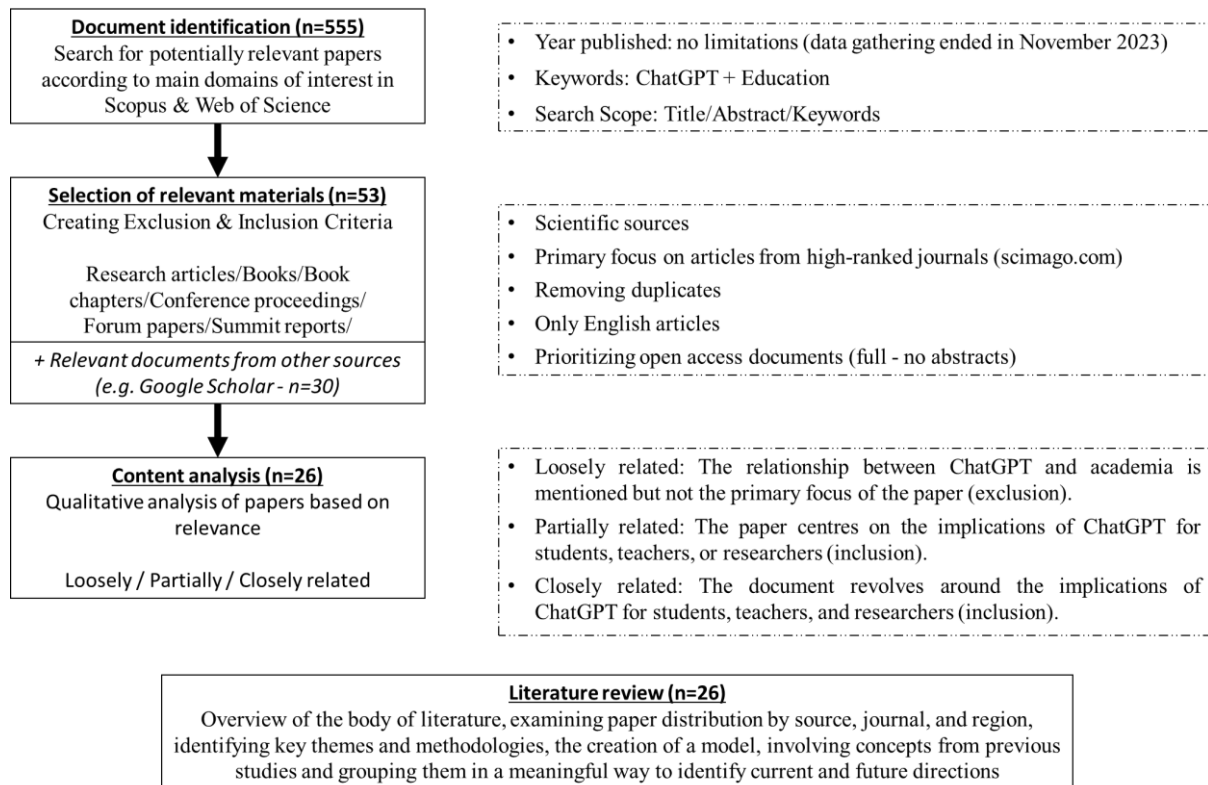
Expanding upon existing literature, this concise literature review seeks to provide an overview of the merits and shortcomings of deploying the popular ChatGPT (3.5) in one of the most contested realms –academia. Through an examination of relevant literature, it also underscores key elements in the effort to navigate the potential disruptive impacts of ChatGPT. These aspects will become progressively crucial for future generations, impacting both the evolution of education and the demand for workplace skills, which are intricately linked with the ongoing development of AI tools.

3. Systematic Literature Review

3.1. Method & Design

The methodology employed is a systematic literature review (SLR) focusing on peer-reviewed international articles regarding the use of ChatGPT. SLR is a research method aimed at identifying, evaluating, and synthesising the work of researchers, academics, and practitioners in a systematic and transparent manner. It follows strict guidelines to ensure professionalism, transparency, and replicability. SLR involves detailed research, including the selection, critical evaluation, and synthesis of available literature on a specific topic. This method provides a precise overview of the current state of knowledge on the topic, yielding ‘new’ and reliable results. Articles are selected from prominent databases like Scopus, EBSCO, Web of Science, or Google Scholar based on predefined criteria such as keywords, year, or language. The selection is then narrowed down manually to the most relevant sources (Tranfield et al., 2003; Fink, 2005; Moher et al., 2009; Okoli & Schabram, 2010; Gough et al., 2012; Anand et al., 2022). The SLR process involved the following phases:

FIGURE 3. SYSTEMATIC LITERATURE REVIEW PROCESS



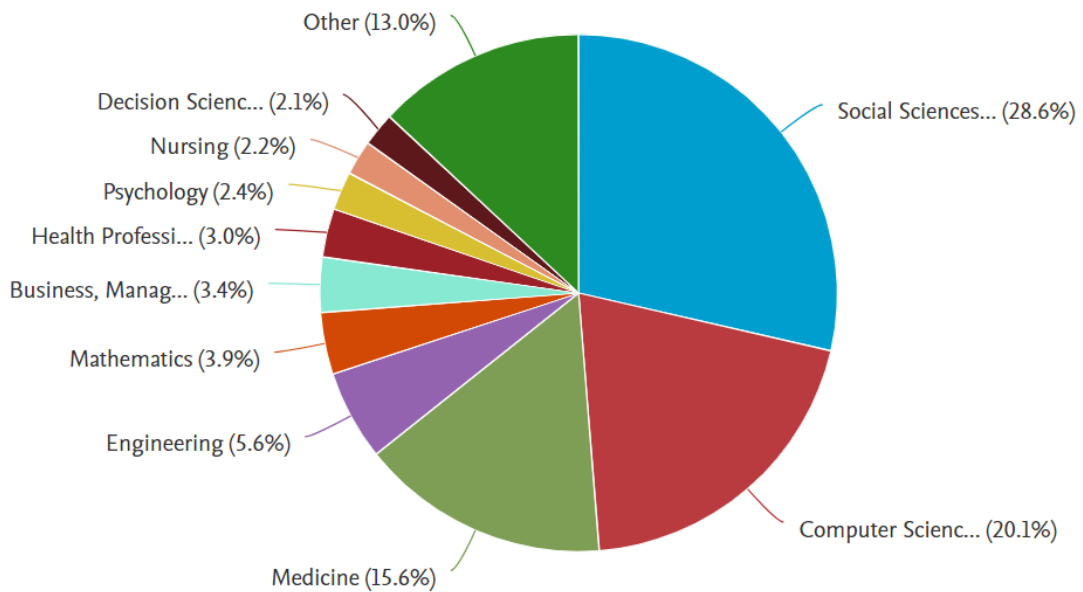
Source: own compilation

3.2. Relevant Literature

Bahroun et al.'s previous study (2023) highlighted the significant and exponential growth in research on generative AIs between 2018 and 2023. The surge in papers published in 2023 is largely attributed to the popularity and innovation catalysed by ChatGPT (Bahroun et al., 2023; Dwivedi et al., 2023). Figure 4 provides an overview of the documents identified in the initial stage of the literature review, categorised by research field, aligning with similar findings reported by Bahroun et al. (2023).

FIGURE 4. POTENTIALLY RELEVANT CHATGPT PAPERS IDENTIFIED IN STAGE 1 (N=555)

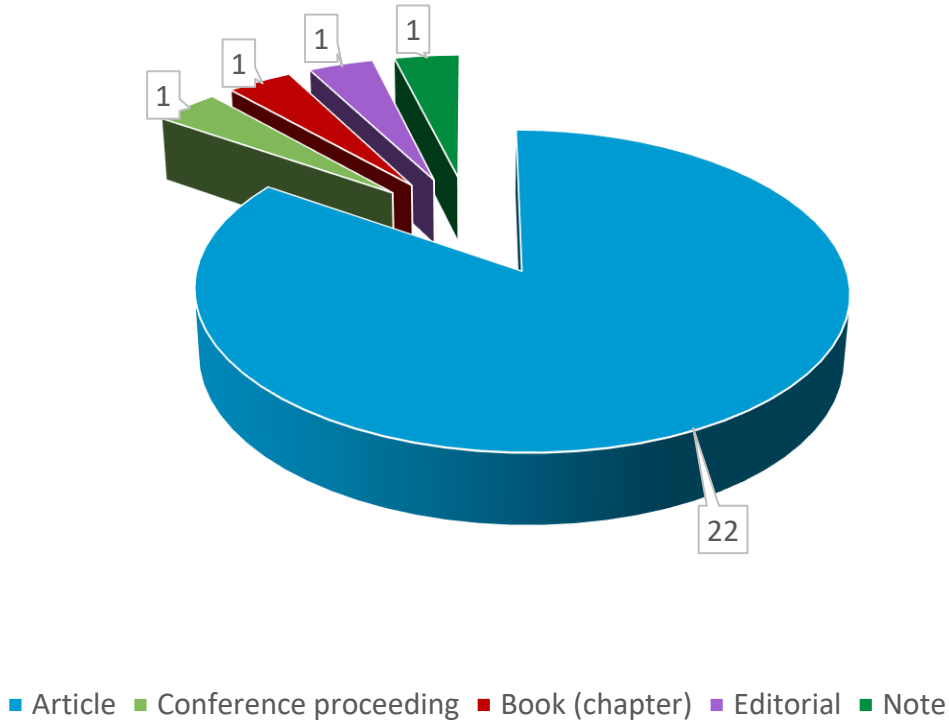
Documents by subject area



Source: Scopus (2023)

As noted, this initial stage of the search typically generates a broad array of literature, necessitating further steps to confirm the relevance of the database results. While Google Scholar may not be the primary database, incorporating this additional approach facilitated the retrieval of further relevant articles initially missed in the database search (also noted by Lo (2023)). Subsequently, the remaining papers underwent a manual, qualitative analysis (Anand et al., 2022; Tranfield et al., 2003). This process led to the identification of selected documents that served as the basis for our review (refer to Figure 5).

FIGURE 5. SELECTED DOCUMENTS FOR THE REVIEW (N=26) BY TYPE



Source: own compilation

To ensure the quality of the documents, it is imperative to rely on high-credibility and prominent (reliable) scholarly sources. Accordingly, the analysis sought to incorporate papers primarily from Q1-Q2 journals. Table 1 presents the journals that have published a minimum of two articles utilised in this review.

TABLE 1. TOP JOURNALS IN SCOPE

Journal name	Quartile	Location	No. of papers used
Contemporary Educational Technology	Q1	Turkey/UK	2
Innovations in Education and Teaching International	Q1	UK	2
International Journal of Educational Technology in Higher Education	Q1	Netherlands	2
Sustainability	Q2	Switzerland	2
Education Sciences	Q2	Switzerland	2
Journal of Applied Learning & Teaching	not yet assigned	Singapore	2
Internet of Things and Cyber-Physical Systems	-	China	2

Source: own compilation based on scimagojr.com

As can be seen in Table 2, since their publication (2023), ten papers have achieved the noteworthy milestone of 50 citations, with Thorp (2023), Dwivedi et al. (2023) and Kasneci et al. (2023) significantly leading the way (283, 241 and 201 citations).

Additionally, the thematic focus of the titles is intriguing, with many expressing scepticism and divisiveness, yet often with a potential ray of hope (positivity) hidden behind the clever (often witty) wording.

TABLE 2. MOST CITED PAPERS IN 2023 RELEVANT TO THIS RESEARCH

Author	Title	Type	Citations
Thorp (2023)	ChatGPT is fun, but not an author.	Editorial (1 page)	283
Dwivedi et al. (2023)	“So what if ChatGPT wrote it?” Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy.	Article (63 pages)	241
Kasneci et al. (2023)	ChatGPT for Good? On Opportunities and Challenges of Large Language Models for Education.	Note (13 pages)	201
Rudolph et al. (2023)	ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?	Article (22 pages)	125
Tlili et al. (2023)	What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education.	Article (24 pages)	115
Cotton et al. (2023)	Chatting and cheating: Ensuring academic integrity in the era of ChatGPT.	Article (13 pages)	106
Ray (2023)	ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope.	Review (34 pages)	77
Lo (2023)	What Is the Impact of ChatGPT on Education? A Rapid Review of the Literature.	Review (16 pages)	68
Lim et al. (2023)	Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators.	Article (13 pages)	57
Farrokhnia et al. (2023)	A SWOT analysis of ChatGPT: Implications for educational practice and research.	Article (16 pages)	56

Source: own compilation based on Scopus

Looking at these papers from a methodological viewpoint, systematic literature reviews, bibliometric analysis, subject matter expert opinions (e.g., both Kasneci et al. (2023) and Dwivedi et al. (2023) with 20+ contributors) and experimenting with ChatGPT were common approaches to capture the dynamic landscape. Only Kasneci et al. (2023) and Lo’s (2023) papers do not acknowledge ChatGPT use, while others utilise various queries and tests (usually with screenshots) to support their arguments. Notably, Cotton et al. (2023) rely on ChatGPT for their entire paper until the Discussion part. The significant presence of ChatGPT within these topics, not only as a subject, but also as a contributor to these articles (about itself) raises future questions about the role of ChatGPT in research and the potential implications for authorship attribution.

3.3. Findings: Teaching, Learning, and Researching with ChatGPT 3.5 and Beyond?

Despite the significant advancements machines have brought to daily life in the 20th century, a visitor from the 19th century would find familiarity in a modern classroom, highlighting the enduring nature of traditional learning environments (Mhlanga, 2023; Rudolph et al., 2023). Lim et al. (2023) observed that the education landscape underwent a significant shift due to the impact of COVID-19, compelling many to engage in remote activities with online classes and

assessments. However, this transformation remains incomplete, as educators still rely on traditional methods like chalkboards, while some incorporate basic technologies such as online game-based learning platforms (e.g., Kahoot or Mentimeter) and videoconferencing tools (e.g., Google Meet, Skype, Microsoft Teams, or Zoom) to introduce ‘modern’ elements into classrooms. The rapid evolution of AI innovations like ChatGPT necessitates a re-evaluation and reimagination of traditional teaching philosophies and classrooms. Therefore, all stakeholders in academia, including students and faculty, must upgrade their skills and adjust their approaches to meet the changing demands of technology (Farrokhnia et al., 2023; Tlili et al., 2023). In pursuit of this goal, Table 4 presents a primary, though not exhaustive, sample of publications examined in this study.

TABLE 4. CHATGPT AND ACADEMIA: EXPLORING OPPORTUNITIES AND CHALLENGES

AUTHOR(S)	TOPIC(S) COVERED				OPPORTUNITIES	CHALLENGES
	T	S	R	B		
Adiguzel et al. (2023)	✓	✓			<ul style="list-style-type: none"> Transforming conventional teaching and learning processes (motivation & engagement): + Intelligent tutoring systems + Self-learning, self-reflection & self-regulation + Automated rating & feedback systems + Tailored learning platforms + Enhancing 21th century skills (e.g., critical thinking and creativity) and collaboration + Support students with special needs + Improve teaching skills, while also helps to analyze and assess a student's learning ability and performance + Replace a significant amount of repetitive (administrative) work e.g., answering FAQs 	<ul style="list-style-type: none"> Ethical and practical challenges Inequalities in the educational system Bias by nature in AI-data Reliability and accuracy Privacy issues Lack of human interaction Over-reliance and dependency on technology Concerns about the rights of intellectual property Transparency and accountability Need of training and support Questions about the role of teachers and the impact on the job market for educators
AlAfnan et al. (2023)	✓	✓			<ul style="list-style-type: none"> + New search engine + Lesson enhancement (debates/workshops) 	<ul style="list-style-type: none"> Dampening human brain Identifying & assessing (originality)
Aydın & Karaarslan (2023)	✓	✓	✓		<ul style="list-style-type: none"> + Wide range of application from Health, Law, Finance, Economy or Business studies + Scientific writing paragraphs with references "close to the truth" (realistic, but not real) 	<ul style="list-style-type: none"> References pointing to non-existent or unpublished works Limits: Logical, but inconsistent and inaccurate answers Cost of training and social, ethical, environmental concerns
Bahroun et al. (2023)	✓	✓	✓		<ul style="list-style-type: none"> + Enhancing interactive learning experiences + Fostering critical thinking skills + Reaching better translation accuracy + Innovative classroom, content creation and assessment practices + Diverse research with contextually relevant responses + Subject-specific education + Student engagement 	<ul style="list-style-type: none"> Responsible and ethical AI usage Acceptance and Adoption Need of new approaches Biases, fairness and academic integrity Privacy and Data Security Inclusivity and Accessibility
Baidoo-Anu & Owusu Ansah (2023)	✓	✓			<ul style="list-style-type: none"> + Personalised & interactive learning + Continuous & consistent feedback + Guide teaching & learning process + Real-time language translations 	<ul style="list-style-type: none"> Biases in data training → reliability, privacy, ethics? Absence of 'real' human interaction Limited understanding (input/output) Creativity/Originality Insufficient contextual understanding Limited capability to tailor instructions
Barrett & Pack (2023)	✓	✓	✓		<ul style="list-style-type: none"> Useful tool for teachers and students: + Brainstorming ideas, modelling answers, or as a form of cognitive off-loading of tasks + Helpful (and acceptable) in the early stages of the writing process (i.e., brainstorming and outlining) + Fulfilling a supportive role focused on idea generation and organization 	<ul style="list-style-type: none"> Easy to 'misuse' (academic integrity) To date no consensus on its usage → Lack of trainings, policies and guidance
Birenbaum (2023)	✓	✓			<ul style="list-style-type: none"> + Improved engagement/collaboration + Increased access to information + Enhanced teaching/study-support + Better assessment & feedback systems + Cost-effectiveness + Personalization + Diverse forms available, such as comic-strips, stories, poems, songs... + Reinforcing 21st-century skills (critical thinking skills, self-learning, problem-solving, argumentation, computer and data literacy etc.) 	<ul style="list-style-type: none"> Improper usage of chatbots Cannot provide (reliable) references Lack of emotional intelligence Concerns about plagiarism and other dishonest behaviors Limitations of training materials & output bias Accuracy and credibility of information Inability to deal with complex and lengthy texts User knowledge and prompt quality altering output quality
Chan (2023)	✓	✓			<ul style="list-style-type: none"> Revolutionize the learning experience: + Provide personalized & real-time feedback + Identifying problem areas and make a room for continuous improvement + Enhance modern learning/digital skills + Providing training and support for teachers + Re-thinking assessments and examinations 	<ul style="list-style-type: none"> Responsibility, accountability, and transparency Fairness & inclusivity Accuracy & explainability Issues with data privacy & security Ethical, social, and economic concerns Decline in writing/critical thinking skills A need for AI education policies & guidance
Cotton et al. (2023)	✓	✓			<ul style="list-style-type: none"> + Better student involvement, cooperation, & accessibility + Asynchronous communication, prompt feedback + Support student groups & endorse remote learning + Wide range of application (summarization, question answering, translation etc.) 	<ul style="list-style-type: none"> Academic (dis)honesty & plagiarism Inequities among users/non-users
Farrokhnia et al. (2023)	✓	✓			<ul style="list-style-type: none"> Making key activities more efficient: + Wide range of plausible outputs + Real-time access to information + Personalised and complex learning + Decrease teaching work-load 	<ul style="list-style-type: none"> Lack of understanding of the context Academic integrity Perpetuating discrimination in education Plagiarism Declining cognitive skills
Firat (2023)	✓	✓			<ul style="list-style-type: none"> + Customised learning experiences + Reshaping the role of educators + Foster the development of soft skills 	<ul style="list-style-type: none"> Identifying & assessing (originality) Digital literacy Social & ethical considerations
George & George (2023)	✓	✓		✓	<ul style="list-style-type: none"> + Tailored learning experiences + Assist teachers in creating personalised lesson plans + Automated feedbacks & grading + Chatbot answering questions about course information/campus services 	<ul style="list-style-type: none"> Lacking skills for contextual understanding & decision-making based on taste or preference (e.g., news updates, complex maths tasks, modifying recipes)
Gill & Kaur (2023)	✓	✓	✓	✓	<ul style="list-style-type: none"> + Individualised coaching & tutoring + Automated assessments & feedbacks + Foster discussions & collaborations + Innovative content production + Improve academic research (data management, identifying trends, patterns, models + predictions) 	<ul style="list-style-type: none"> Consistency & precision (quality) challenges Moral & ethical issues AI-generated unfairness & social prejudice Misplaced faith in AI Generalizability, explainability & contextualisation Sustainability Security & data protection concerns

TABLE 4. (CONTINUED)

AUTHOR(S)	TOPIC(S) COVERED				OPPORTUNITIES	CHALLENGES
Halaweh (2023)	✓	✓	✓		<ul style="list-style-type: none"> + Summarizing and formatting information + Providing reliable and real-time translation + Detecting grammar and style errors + Generating software codes + Providing tutoring and explanation + Solving mathematical calculations and statistical analysis + Developing research skills 	<ul style="list-style-type: none"> - Potential bias and discrimination due to the reliance on NLP - Inaccuracies and plagiarism - Privacy concerns (search and query data) - Lack of creativity and critical thinking - Concerns about job loss
Kasneji et al. (2023)	✓	✓	✓		<ul style="list-style-type: none"> + Generate interactive study material + Individualised learning experiences + Enhance student engagement & interaction + Empower learners with disabilities 	<ul style="list-style-type: none"> - Copyright issues - Bias & fairness - Over-reliance - Lack of understanding & expertise - Data privacy & security - Sustainable usage - Cost to verify information (+integrity) - Lack of adaptability - Cost of training & maintenance - Identifying & assessing (originality/reliability)
Kooli (2023)	✓	✓	✓		<ul style="list-style-type: none"> + Innovating research and assessments (efficiency / accuracy / cost-effectiveness) + Easy to process vast amounts of data and identify patterns and relationships + Personalising learning pathways + More equitable and inclusive education + Improved engagement and motivation + Automated repetitive tasks + More engaging and interactive experiences + Instant feedback and support 	<ul style="list-style-type: none"> + Co-living, sustainability and continuous adaptation – policies and guidance? + Biases and discrimination + Unreliable or biased results → Misuse or manipulation? + Inclusion and equity + Ethical and social concerns vs. data usage + Accountability, transparency and security + Over-reliance on AI + Future of academic work
Lo (2023)	✓	✓			<ul style="list-style-type: none"> + Easy access to large datasets, summarise content, real-time answers + Facilitating collaboration/engagement <p>Teachers:</p> <ul style="list-style-type: none"> + Assistant for instructors (e.g., generating course materials and providing suggestions/translations/summaries) + Support assessments (generate-evaluate) <p>Students:</p> <ul style="list-style-type: none"> + Virtual tutor for students (e.g., answering questions, getting personalised feedbacks real-time, providing ideas and „first drafts“, sense- and grammar-checking already written pieces) 	<ul style="list-style-type: none"> - Accuracy and reliability - Biased data - Limited (up-to-date) knowledge - Partly correct / fake information - AI-assisted cheating / plagiarism - Responsible and ethical concerns
Mhlanga (2023)	✓	✓			<ul style="list-style-type: none"> + Empowering teachers with new tools + Student engagement & collaboration + Hands-on, experiential learning 	<ul style="list-style-type: none"> - Identifying & assessing (originality) → Accuracy & relevancy? - Respect for privacy, fairness & non-discrimination + transparency
Rahman & Watanobe (2023)	✓	✓	✓		<p>Free up teachers:</p> <ul style="list-style-type: none"> + Automated feedback & assessment + Data, lesson preparation, discussions <p>Enhance students' experience:</p> <ul style="list-style-type: none"> + Personalised learning tutor + Wide applicability (data, ideas, translation, writing + technical) + skill enhancement + Foster group discussions & debates + Accessibility for disabled (e.g., speech2text function) <p>Improve research:</p> <ul style="list-style-type: none"> + Provide research ideas, summaries + Correct typographical errors, grammar, vocabulary etc. 	<ul style="list-style-type: none"> - Identifying & assessing (originality) - Over-reliance - Output quality concerns - Diminished critical thinking & problem solving skills - Ethical implications & biases - Cheating & misinformation
Rathore (2023)	✓	✓	✓	✓	<ul style="list-style-type: none"> + Personalised teaching/learning content + Streamline collab & communication + Consistent, high-quality academic content 	<ul style="list-style-type: none"> - Plagiarism
Rudolph et al. (2023)	✓	✓			<ul style="list-style-type: none"> + Widely accessible (mostly) quality information on a variety of topics + Fast & flexible human-like responses + Cost-effective 24/7 personal assistant + Supporting individual writing and research + Enhancing digital literacy and increasing future employability + Improving writing skills and generating new ideas + Assisting in solving real-world problems real-time 	<ul style="list-style-type: none"> - The future of white-collar knowledge work - Plagiarism - Aligning learning objectives, teaching and assessments - Not providing reliable sources / quotations - Difficulty of distinguishing human and ChatGPT-generated text - Loss of creativity and originality - Lack of contextual/emotional understanding - Limited understanding and data - Quality, misinformation and jailbreaking
Shidiq (2023)	✓	✓			<ul style="list-style-type: none"> + Assist & enhance (self-)learning + Improve performance & motivation: Virtual mentors/voice assistants + Innovative content + Smart classrooms + Easy to make content (poems, novels etc.) 	<ul style="list-style-type: none"> - Lack of direct interaction (emotional connection) - Learning requires creativity - Contextual understanding (user/ChatGPT) - Over-reliance socially → inferiority - Over-reliance psychologically → skill loss - how to use responsibly & ethically?
Tlili et al. (2023)	✓	✓	✓		<ul style="list-style-type: none"> + Prepare (teaching/learning) material + Offering a comprehensive grasp of diverse complex topics in straightforward way + Reduce the teaching burden for educators + Offer students instant feedback 	<ul style="list-style-type: none"> - Plagiarism, cheating, & laziness - Honesty & truthfulness - Privacy, misleading, & manipulation - Dampen innovative & critical thinking - Response quality – prone to errors - Non-human (too realistic) interactions

Note: T=teacher, S=student, R=research, B=business implications, where grey ticks indicate partial mentions

Source: own compilation

Looking at the insights provided in Table 4 concerning the opportunities and challenges presented by AIs like ChatGPT, it is evident that even with its limits, ChatGPT has the potential to revolutionise our world. According to Lo (2023), ChatGPT exhibits promising outcomes in various domains, excelling particularly in critical and high-order thinking, economics, programming, and English language comprehension. With its broad accessibility, quick learning, and capacity to offer nearly limitless, prompt, and intelligible human-like answers spanning diverse topics in multiple languages, it asserts itself as a transformative force for all stakeholder groups:

- **Reimagining the traditional role of educators** by (1) accessing and preparing teaching materials and plans; (2) automating evaluation and continuous feedback; (3) fostering interactive ‘smart’ class activities; (4) streamlining collaboration/communication; (5) adding a virtual assistant for answering questions about course information or campus services.
- **Offering better, individualised and interactive learning experiences** by (1) allowing easy access to a ‘limitless’ database; (2) real-time generating (seemingly) quality (and easy to understand) answers on various topics (from creative writing to technical questions) in multiple languages; (3) giving continuous feedback as a virtual mentor/tutor (4) offering interactive and innovative classrooms and activities; (5) stimulating collaboration and group work (6) customising content and accessibility for (nearly) all (7) improving self-learning and soft skills.
- **Making it easier to conduct research and improve its quality** by (1) efficiently storing and accessing data; (2) identifying trends, patterns, models and making predictions; (3) streamlining collaboration/communication; (4) easily writing even paragraphs (e.g., introductions or summaries); (5) correcting typographical, grammar, and language errors.

Consequently, as emphasised by Kooli (2023), the existence of AI systems and chatbots in education should be viewed as an opportunity for advancement rather than a threat. However, instead of collaboratively striving for an improved AI-enhanced future, there is a trend of perceiving ChatGPT as a malevolent force, leading to its prohibition in certain institutions, such as universities and journal editorial boards (see Dwivedi et al. (2023)). Meanwhile, elsewhere globally, organisations are revising plagiarism policies due to concerns about academic integrity and reverting to pen-and-paper-based exam and assessment procedures (Barrett & Pack, 2023; Chan, 2023; Rudolph et al., 2023; Thorp, 2023).

Choudhury and Shamszare (2023) addressed the significance of striking a ‘golden mean’ in this context as well: while excessive dependence and uncritical trust in ChatGPT can lead to dire consequences, completely avoiding seemingly valuable technology may result in missed opportunities. Dwivedi et al. (2023) highlight that the academic sector faces significant disruptions with the emergence of ChatGPT: its capabilities, like offering personalised feedback and access to diverse knowledge, can transform student-teacher interactions and assessment methods.

Additionally, the influence of ChatGPT clearly reaches beyond education, as several academic articles co-authored by the AI have already been published. A prominent concern is that AI lacks accountability for content, potentially undermining the criteria for authorship and devaluing research publications.

Presently, ChatGPT is acknowledged for its utilisation (only) as an assistant in desk work, including data mining, idea generation, and language/grammar enhancement (Dwivedi et al., 2023). As Thorp (2023, p. 313) suggested, machines play a crucial role in the writing/research process today; they serve as tools for individuals to formulate hypotheses, design experiments, and interpret results. However, in the end, the work must be “*original*,” with “*the product originating from—and being expressed by—the wonderful computer in our heads*.” This also underscores that it remains crucial for users not to unquestioningly accept everything (Tlili et al., 2023) and to add human effort, as education, (creative) writing, and research are still perceived as “*human-centric*” processes rather than “*robot-centric*” (Dwivedi et al., 2023, p. 34).

In agreement, Birenbaum (2023) characterises Chatbot tools as “*efficient helpers*” similarly Kooli (2023) views them as “*research assistants*” that cannot replace humans. As per Barrett and Pack (2023), relying on generative AIs to entirely fulfil writing assignments, whether disclosed or not, is deemed unacceptable. However, they discovered that the use of such “*supporting tools*” is considered (more) acceptable in the initial stages of the writing process, such as brainstorming and outlining.

Here, it must be mentioned that we are just beginning to witness the impact of ChatGPT on various sectors, including higher education, as highlighted by Rudolph et al. (2023) and Farrokhnia et al. (2023). It is crucial to recognise that our understanding of this technology is still evolving, with many limitations to address, such as issues related to training data, output quality, and biases (Dwivedi et al., 2023; Ray, 2023). International coordination is necessary to establish guidelines and ethical codes for GAIs like ChatGPT to ensure their secure and responsible use (Dwivedi et al., 2023).

Correspondingly, Chan (2023) categorises the implications of ChatGPT-like AIs into three main areas: (1) Pedagogical, focusing on improving teaching and learning outcomes; (2) Governance, addressing issues of privacy, security, and accountability; and (3) Operational, dealing with infrastructure and training, emphasising the need for comprehensive understanding and action within each dimension to integrate AI seamlessly into academic settings. To illustrate the significance of these challenges, as we approach the end of 2023, one year into the ChatGPT-journey, key stakeholders may still lack awareness of ChatGPT’s capabilities, relying on sensationalist reporting in news and social media. Barrett and Pack (2023) highlight the absence of university policies on AI usage, with 94.1% of teachers reporting a lack of such policies and 89.7% admitting to never educating students on AI use. To address this, guidance and training programs should be implemented to educate stakeholders on ChatGPT’s functions, accuracy evaluation, information assessment, and query tracking (Cotton et al., 2023; Halaweh, 2023; Lo, 2023; Rudolph et al., 2023; Tlili et al., 2023). This underscores the need for clear university (and journal) policies on ChatGPT’s acceptable use, considering the following points:

- Available training and guidance regarding the ‘safe’ usage of AIs.
- Skill enhancement recommendations connected to new AI models.
- How to examine and evaluate the information generated by GAIs.
- How to check the accurate source of the information and use/cite it accordingly.
- The importance of manual editing and proofreading, which still remains essential.

- The rules of Human-AI collaboration – the role of humans vs. AI.
- Guidelines on acknowledging the assistance of ChatGPT in any work.
- What is plagiarism, what are its potential consequences, and what detection tools are in place?
- The dawn of rethinking the form of traditional assessments and study activities.

Apart from the present absence of common policies and a clear understanding of its usage, a significant limitation of ChatGPT is its inability to provide correct sources and quotations (Rudolph et al., 2023), coupled with the occurrence of incorrect, inaccurate, or outdated answers (Aydın & Karaarslan, 2023), leading to issues with output origin, quality, and reliability. As mentioned earlier, these systems are expected to evolve over time (GPT3-GPT4). For now, while recognising our limited understanding and the existing constraints of the technology, the emphasis should be on utilising it decently within the limits. This involves designing specific interventions to use chatbots properly and constructively (Birenbaum, 2023).

On this occasion, Ray’s in-depth analysis offers a comprehensive overview of the topic, illuminating the major challenges associated currently with ChatGPT-3.5 (2023, pp. 147-148):

- **Biases arising from the training data of the model**, which mirrors content generated by humans from the internet: (1) gender, racial, and cultural biases; (2) language bias; (3) ideological bias; (4) sensationalism and clickbait bias; (5) confirmation bias; (6) temporal bias; (7) exclusionary bias; (8) commercial bias; (9) cognitive bias; (10) attention bias; (11) format bias; (12) source bias; (13) novelty bias; (14) positive/negative sentiment bias; (15) outlier bias; (16) implicit bias; (17) authority bias; (18) recency bias; (19) groupthink bias; (20) anchoring bias; (21) availability bias; (22) false consensus bias; (23) hindsight bias.
- **Limitations of the new AI technology**: (1) inherent biases in training data; (2) incomplete or outdated knowledge; (3) inability to discern factual accuracy; (4) lack of contextual awareness; (5) ethical and moral reasoning limitations; (6) long conversational context challenges; (7) inability to generate visual content; (8) difficulty handling inappropriate or harmful requests; (9) difficulty recognising and adapting to user expertise; (10) limited emotional intelligence; (11) lack of personalised feedback; (12) limited domain-specific expertise; (13) inability to interact with external systems; (14) difficulty handling multilingual queries; (15) difficulty with non-literal language; (16) limited creativity; (17) overgeneralisation; (18) inconsistency in quality; (19) energy consumption and environmental impact; (20) difficulty capturing human intuition; (21) lack of self-awareness; (22) resource requirements for training and deployment.

In line with Ray’s findings (2023), Dwivedi et al.’s (2023) extensive study summarised the key challenges of GAIs such as ChatGPT within the following points: (1) accountability, transparency and explainability (output quality vs “*black box*”); (2) limited understanding and prompts; (3) out-dated information (pre-2021) and inability to integrate real-time data automatically, (4) potential of misuse and abuse; (5) cultural, social, ethical and legal issues; (6) concerns about the future of jobs and dependence on technology; (7) dampening critical skills due to GAIs (8) plagiarism, cheating and lack of originality, plus other embedded biases. As evident from these points, like all historical ‘Holy Grails,’ the challenge lies in harnessing ChatGPT’s potential for ‘good’ purposes. As Ray (2023) and Dwivedi et al. (2023) astutely

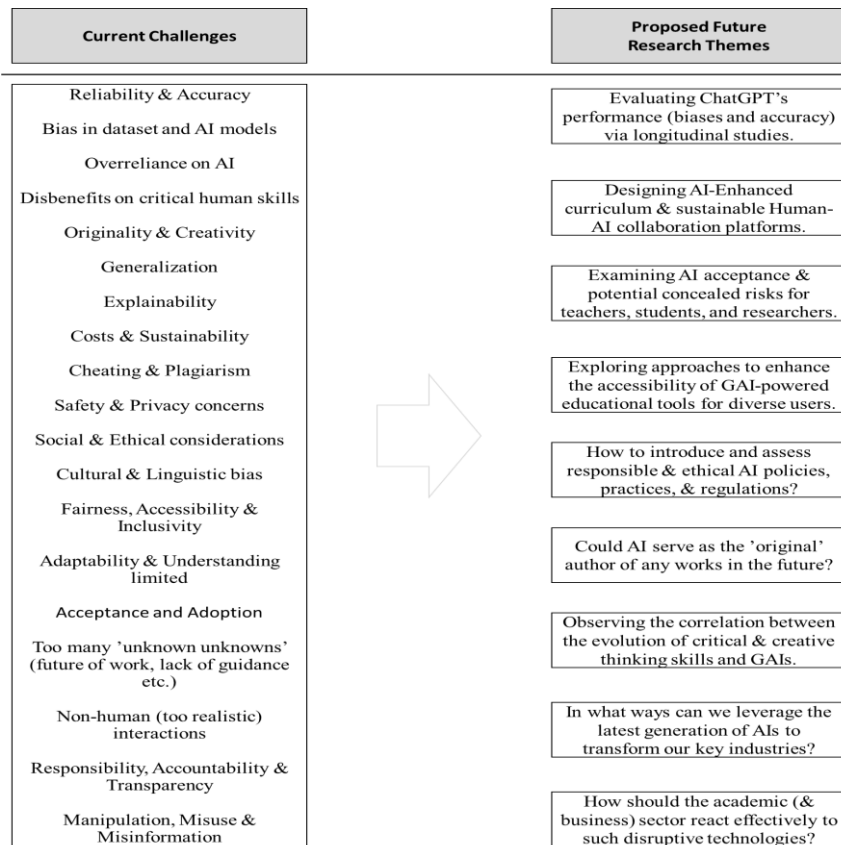
concluded, this endeavour is accompanied by numerous ethical challenges. To prevent any form of harm, whether direct or indirect (George & George, 2023), Mhlanga (2023) has compiled solutions for these challenges, which include:

- Transparency in the use of ChatGPT.
- Respect for privacy.
- Accuracy of information.
- Fairness and Non-Discrimination.
- ChatGPT is not a substitute for humans.
- Responsible AI – Educating people.

To prevent the exploitation of vulnerable individuals and communities, it is crucial to address these key concerns proactively. This includes preventing the leakage of personal and secure information and mitigating unintended consequences or discriminatory outcomes (see earlier examples). Additionally, measures should target the prevention of misuse, misleading information, and manipulation, for example, in market research or opinion polls driven by specific financial or political interests. Moreover, efforts must be made to halt the dissemination of fabricated or false information, such as in research or schoolwork, as this undermines the fundamental principles of research and learning (Kooli, 2023).

Given the contentious ‘myths’ surrounding the subject these days arising from the outlined positive and negative aspects of the innovative-disruptive technology, it is essential to conduct a more in-depth exploration (Bahroun et al., 2023; Dwivedi et al., 2023). To make it more concrete, Lim et al. (2023, p. 9) outlined four key paradoxes associated with the topic, comprising: (1) *”A friend yet a foe”*; (2) *”Capable yet dependent”*; (3) *”Accessible yet restrictive”*; (4) *”Gets even popular when banned”*, which summarises perfectly the current relationship status of ChatGPT and people. Drawing from these findings, several potential avenues for future research can be proposed to enhance our understanding of AI in academic settings (as suggested in Figure 6):

FIGURE 6. THE FRAMEWORK OF CURRENT CHALLENGES AND FUTURE THEMES ON AI RESEARCH



Source: own compilation

Despite the reconcilable contradictions highlighted earlier, ongoing technological advancements will inevitably reshape research processes and revolutionise educational systems (e.g., idea generation or text writing). While banning ChatGPT to mitigate its perceived threat to education may seem plausible, historical evidence suggests that such high-profile items often become more popular when prohibited, as previously noted by Lim et al. (2023). Additionally, it is essential to acknowledge that tech-savvy students can always find alternative ways to access such technologies (Farrokhnia et al., 2023). Moreover, relying solely on new AI detection software to counteract AI usage may not effectively address the core issue, as emphasised by Rudolph et al. (2023) and Dwivedi et al. (2023). Conventional assessments are on the verge of obsolescence since the advent of remote learning (COVID-19) and now ChatGPT, necessitating more imaginative and innovative methods in re-designing soon-to-be outdated home and classroom activities. Faculties can utilise these tools to aid in writing and research, but they cannot replace critical thinking and original work (Rudolph et al., 2023). As education increasingly integrates AI, there is a pressing need to prioritise the development of higher-order learning outcomes, including creativity and critical thinking skills (Farrokhnia et al., 2023).

At this juncture, Kooli (2023, p. 1) underscored the pressing need to adapt to the new reality of AI systems and chatbots, stating, “*Co-living, sustainability, and continuous adaptation to the development of these systems will become a matter of emergency. Raising awareness, adopting appropriate legislation, and solidifying ethical values will strengthen research and protect educational systems.*” Similarly, Adiguzel et al. (2023) and Cotton et al. (2023) emphasised

that regardless of future developments in AI technology, this serves as a wake-up call for all stakeholders, particularly in academia, necessitating a careful reconsideration of existing work practices to ensure the effective integration of AI into daily operations without adverse consequences. As Lim et al. (2023) added, since GAI tools offer both challenges and opportunities, educational bodies and institutions must actively monitor and regulate their use, recognising the need for a cultural shift in approaching these disruptive technologies. Tools like Bard, ChatGPT, and DALL-E are transforming learning, communication, collaboration, and work, prompting a re-assessment of established practices to ensure preparedness and relevance for the future. In our case, this could involve formulating policies and procedures for their use, providing training and assistance to both students and faculty and employing diverse strategies to identify and prevent academic dishonesty (Cotton et al., 2023). Aligning curricula and learning objectives, including tasks, assessments, and criteria, demands critical literacies like media and digital literacy (Farrokhnia et al., 2023). Moreover, exploring human-machine collaboration strategies is crucial to empower users, especially with tools like ChatGPT, for improved writing outcomes, as noted by Tlili et al. (2023). Ultimately, ChatGPT is expected to positively impact productivity by automating mundane tasks, freeing individuals to focus on creative and non-repetitive activities (Dwivedi et al., 2023), potentially influencing organisations, societies, and individuals alike.

In essence, ChatGPT, like any technology, presents both positive and negative aspects, calling for thorough analysis and discussion on its adoption rather than outright dismissal or prohibition. The education sector, for example, is undergoing rapid transformations due to such advancements, necessitating a shift in the skill set required for future student-teacher collaborations (e.g., increased critical thinking skills in evaluating information and generating new ideas, as well as proficiency in presentation skills). Assessments now commonly include presentations and defending one's work, potentially in tandem with ChatGPT, to verify learning outcomes (Halaweh, 2023). Moreover, in research, the role of text writing may diminish as tools like ChatGPT offer efficient support (Dwivedi et al., 2023). Additionally, this also influences the skill set needed for future workplaces. Responding to Tlili et al.'s (2023, p. 18) prompt about chatbots serving as both educational guardian angel and a devil, ChatGPT remarked, "*Chatbots are here to stay, for better or for worse!*" Correspondingly, Kasneci et al. (2023, p. 2) highlighted, "*Overall, large language models will continue to push the boundaries of what is possible in natural language processing.*" However, addressing the limitations and ethical concerns surrounding these systems remains a significant undertaking, as underscored by numerous researchers, highlighting the necessity for further investigation into ChatGPT's implications and future prospects.

4. Discussion & Conclusions: ChatGPT an Educational Guardian Angel or Mischief-Maker in Disguise?

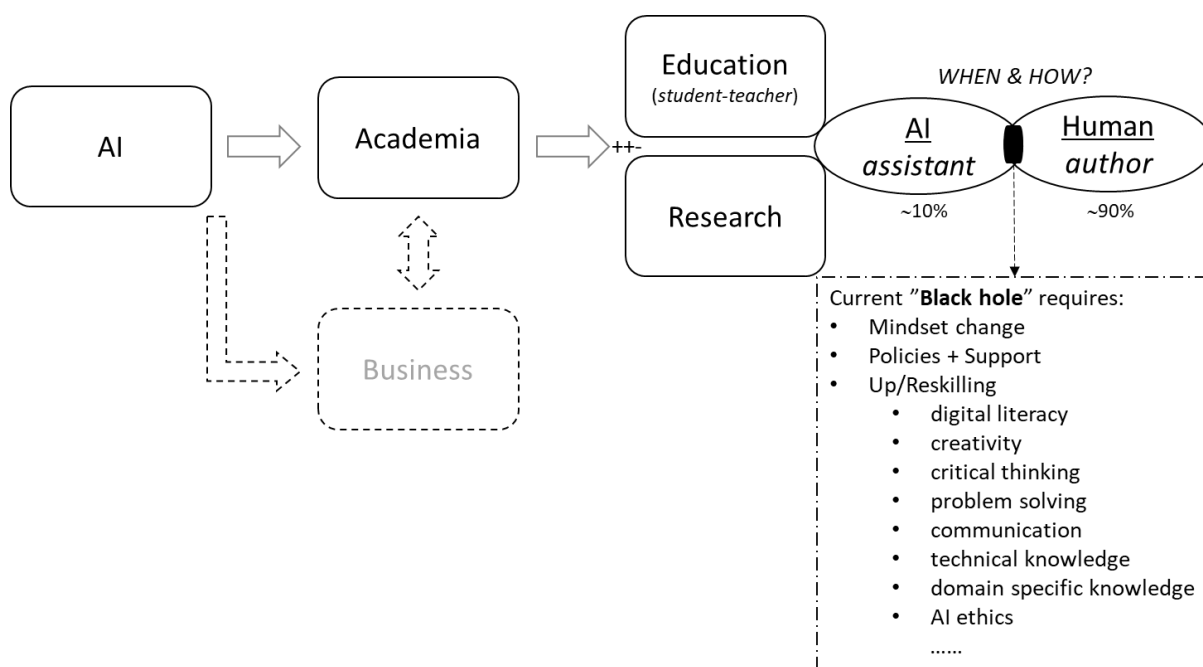
This study demonstrates the impressive advancements in Artificial Intelligence (AI), notably in ChatGPT's capacity to replicate human behaviour and generate persuasive, human-like writing across diverse domains since November 2022, spanning from poems to entire research papers. The review confirms the significant potential of ChatGPT, prompting a need to explore its impact on academia. Given AI's potentially pivotal role in education, research, and business, it is essential for current and future generations to master these tools. Correspondingly, this paper offers insights into ChatGPT-3.5's utilisation in research and education, highlighting challenges and opportunities for stakeholders and posing important questions for future research. It holds

value for policymakers, educators, researchers, and practitioners, offering both theoretical insights and practical recommendations to enhance and safeguard the future use of AIs in academia. Theoretically, this study contributes additional insights to the ongoing discourse surrounding the utilisation of chatbots in academia as it delves into the countless opportunities and challenges presented to each stakeholder. Additionally, it highlights practical recommendations and underscores the necessity for collaborative efforts from all involved parties globally to enhance and safeguard the future utilisation of AIs.

4.1. ChatGPT's Longevity: Control Lies in Our Hands Regarding 'WHEN' and 'HOW'

The analysis underscores ChatGPT's multifaceted utility, extending beyond simple conversation to enriching human knowledge and enhancing capabilities. Seamlessly streamlining processes, ChatGPT serves as a valuable asset, offering efficiency and effectiveness in tasks spanning technical challenges like mathematics, project management, engineering, programming, and healthcare, as well as non-technical areas such as language, art, and literature (RQ1). The utilisation of chatbots also raises various ethical issues concerning data privacy, data bias, accountability for accuracy, transparency shortcomings, and potential for misuse, among others. According to the findings, to this day, the 3.5 version possesses certain limitations, including the absence of common sense, a nuanced understanding of context, potential biases in training leading to output bias, challenges with complex reasoning, and an incapacity to process more intricate information (Baidoo-Anu & Owusu Ansah; 2023; Dwivedi et al., 2023; Gill & Kaur, 2023; Kasneci et al., 2023; Rahman & Watanobe, 2023; Ray, 2023; Shidiq, 2023; Tlili et al., 2023). Therefore, it is crucial to bear in mind the constraints of ChatGPT while utilising it, and one should avoid relying entirely on this still developing technology as the output may be just "*an opinion without reference*" (Tlili et al., 2023, p. 10) from a "*sophisticated bullshit generator*" (Dwivedi et al., 2023, p. 34), so at present "*Nothing should be taken for granted*" with ChatGPT (Tlili et al., 2023, p. 19). In alignment with the conclusions of previous works, it is imperative to emphasise that we are in the nascent stages of the Chat/AI-journey, with many unexplored areas (Aydın & Karaarslan, 2023; Dwivedi et al., 2023; Farrokhnia et al., 2023; Ray, 2023; Rudolph et al., 2023). Consequently, the implementation, utilisation, and dissemination of GPT results should be guided by distinct principles of responsibility and ethics (including considerations related to bias and discrimination, privacy and security, technology and information misuse, accountability, transparency, and social impact). As it is suggested, tackling these challenges will optimise AI models, enhancing their performance, utility, and user experience. This improvement extends their effectiveness across applications and industries, promising streamlined processes, improved efficiency, cost reduction, and collaboration (Dwivedi et al., 2023; George & George, 2023; Gill & Kaur, 2023; Rathore, 2023; Ray, 2023).

FIGURE 7. SUMMARY OF FINDINGS ON CURRENT HUMAN-AI ACADEMIC COLLABORATION



Source: own compilation

This paper can also serve as a reference study, raising awareness among academic stakeholders about the potential misuse of chatbots and prompting the implementation of sustainable measures to address these concerns. Moreover, it can aid in comprehending the challenges linked to the extensive use of chatbots and AI in education and research. While ChatGPT currently affords numerous possibilities, like automating basic school tasks, providing personalised learning materials, and assisting researchers (in the initial stages), its widespread acceptance is currently confined to basic, repetitive tasks such as data mining and language editing (RQ1). As uncovered, human expertise, judgment, and creativity remain irreplaceable, and the deeper integration raises concerns about user (data) safety, the origin and reliability of data, and the ethical-responsible use of the output. Based on the research, recommendations include human authors meticulously reviewing and validating information produced by ChatGPT (Cotton et al., 2023; Dwivedi et al., 2023; Rahman et al., 2023; Thorp, 2023), acknowledging that AI cannot be a real (original) author and any AI assistance should be mentioned in all works (see for example the acknowledgements of Cotton et al. (2023)). Additionally, a “Not By AI badge” approach can be used – if a minimum of 90% of the content is human-produced (which aligns with the presently accepted theoretical threshold – see Figure 7). Practically speaking, for the future optimisation of the benefits and mitigation of risks currently associated with ChatGPT, the broader stakeholder group should consider the following aspects: (1) bidding farewell to traditional, yet outdated (academic) practices; (2) acknowledging and valuing the role of human ‘checkpoints’ in the process; (3) enhancing users’ competencies to adapt alongside evolving technologies; and (4) fostering the development of ethical and responsible chatbots, along with the formulation of pertinent policies, guidelines, and practices for the secure, ethical, and effective utilisation of AIs (Alafnan et al., 2023; Baidoo-Anu & Owusu Ansah, 2023; Firat, 2023; Tlili et al., 2023).

Despite the existing misconceptions discovered during the review, ChatGPT is not diabolical (RQ2), and dismissing it based on such beliefs may result in missed opportunities for innovation

(Choudhury & Shamszare, 2023; Kooli, 2023). In understanding with Gill and Kaur (2023), Rudolph et al. (2023) and Kasneci et al. (2023), this paper underscores the notion that although technology strives to enhance our daily experiences, it is our responsibility to exercise caution in the use of it (i.e., ChatGPT-3.5), as its application ultimately depends on how we humans utilise it, akin to any inanimate object: we must critically assess and address privacy, security, environmental sustainability, regulatory, social, and ethical concerns. This process necessitates ongoing human oversight, guidance, and critical-creative thinking to ensure responsible and sustainable scaling of technological advancements. As a result, this paper also invites academia policymakers, business professionals, and technology experts to collaborate and initiate dialogues on the proper and constructive utilisation of emerging GAI tools to enhance education, research and science, since there is a great concern that the future misuse of AI intelligence systems and chatbots may undermine the goal of fostering knowledge and capacity-building processes. To pre-empt this, there is a need for a mindset change, clear policies, support for learning and adapting to them through training, and upskilling/reskilling (see Figure 7). It is crucial to understand WHEN (for what purposes) and HOW we can utilise AIs fairly and ethically, maximising their potential to the fullest extent possible.

As a final remark, the observations strongly indicate that a new era of AIs, spearheaded by ChatGPT, is on the horizon, particularly in the realms of education and research. Embracing such a significant transformation is essential for academia to stay abreast of evolving trends. Resisting progress by reverting to traditional methods like ‘pen and paper’ would be akin to burying our heads in the sand in an increasingly tech-savvy world. Technology and AI are constantly evolving alongside their roles in society. As an example, Google’s recent launch of ‘Gemini,’ an AI model integrated into all Google apps, is positioned to outperform even OpenAI’s GPT-4. Likewise, the introduction of voice as a recent ChatGPT feature presents numerous new capabilities. Additionally, the integration of DALL-E and the potential to generate images with ChatGPT, along with the Consensus expansion, which answers queries based on published papers, further contribute to the evolving field of AI. Naturally, actions prompt reactions; for instance, Turnitin, a leading anti-plagiarism tool, is currently striving to improve its ability to detect content generated by ChatGPT. As of now, the outcome of this ongoing pursuit remains uncertain in the game of cat-and-mouse. To navigate this evolving landscape successfully, it is imperative to continuously explore the potential of (G)AIs, formulate comprehensive guidelines, and foster critical and creative thinking skills. This approach will contribute to the development of a technologically advanced, inclusive, and effective educational landscape as the true AI race is just beginning...

“The rise of powerful AI will be either the best or the worst thing ever to happen to humanity. We do not yet know which.”

Stephen Hawking (2016)

4.2. Limitations and Future Directions

While the Systematic Literature Review served as a valuable method to assess the existing knowledge on ChatGPT, it is essential to recognise the limitations of this study, which necessitate further investigation. As an SLR (see Tranfield et al., 2003; Moher et al., 2009; Okoli & Schabram, 2010; Gough et al., 2012; Anand et al., 2022), the primary limitation stems from the absence of primary research.

Furthermore, the decisions made in a review can be subject to debate, influenced by many factors such as the researcher's background, expertise, or perspective. For example, the keywords or quality criteria used (e.g., prioritising Q1-Q2 journal articles) may lead to the exclusion of pertinent studies, and the sample is inherently constrained by the available offerings in the chosen databases. While abundant research exists in this field, with mostly qualitative ones, as we can see, many reviews centre on the issue of originality (plagiarism) and the future of assessments, representing just a fraction of the broader ChatGPT landscape. While relying on snapshots of findings (qualitative or quantitative) provides a comprehensive view at a given point in time (AlAfnan et al., 2023; Shidiq, 2023), it is crucial to supplement these with more longitudinal, comparative, and experimental studies. This approach is essential for acquiring a more profound comprehension of the long-term effects and various impacts and expectations from stakeholders, especially educators, researchers, and students, as also underscored by Firat (2023). Proposed avenues for future research encompass (1) monitoring the performance of ChatGPT over time; (2) designing a sustainable AI-enhanced curriculum; (3) examining AI acceptance, applicability, accessibility and potential risks; (4) exploring the application and assessment of responsible and ethical policies, practices, and regulations; (5) AI as an (co-)author?; (6) critical skills for AI usage, and (7) investigating the adoption of ChatGPT across diverse industries (Figure 6). Future research should aim to evaluate these dilemmas and devise effective solutions through quantitative research. Given the complexity and dynamic nature of this field, interdisciplinary research collaborations are recommended: bringing together expertise from education, research, computer science, psychology, ethics, and other relevant fields can contribute to a more comprehensive understanding of the manifold impacts of ChatGPT. While this study refrains from providing a definitive answer on whether '(d)evil' AI can replace humans in the near future, it adds value to both the literature and practical applications by attaining a deeper comprehension of the novel Chat-phenomenon and identifying crucial questions and directions for future research.

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Ethics Statement

No dataset is associated with this article.

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Corresponding Author

The corresponding author for this manuscript is Griszbacher Norbert who can be contacted by email via griszbachern@gmail.com.

Appendix

FIGURE A1. CHATGPT IN 'PLAY'

Default (GPT-3.5)

NO Produce several witty and intelligent titles for an academic research paper on the pros and cons of using chatgpt for work and learning

1. "ChatGPT Chronicles: Unveiling the Dual Nature of AI in Work and Learning"
2. "The Chatterbox Dilemma: Exploring ChatGPT's Impact on Work and Learning"
3. "Unveiling the Digital Pandora's Box: ChatGPT in Work and Learning"
4. "ChatGPT: A Friend or Foe in the Worlds of Work and Learning?"
5. "Talking with ChatGPT: The Pros and Cons in Work and Education"
6. "ChatGPT's Two-Faced Coin: Navigating Its Potential in Work and Learning"
7. "ChatGPT Unleashed: Navigating the Benefits and Pitfalls in Work and Learning"
8. "Conversational AI in the Classroom and Office: A Double-Edged Sword"
9. "From Chatbots to ChatGPT: Reimagining Work and Learning"
10. "Beyond Chit-Chat: ChatGPT's Complex Role in Work and Learning Environments"

NO rephrase Today ChatGPT can be used to solve technical (e.g., engineering and computer programming) and non-technical (e.g., language and literature) problems.

Regenerate

Send a message

ChatGPT can make mistakes. Consider checking important information.

Source: ChatGPT (<https://chat.openai.com/>)