ARTIFICIAL INTELLIGENCE (AI) IN ACADEMIC WRITING AND LEARNING : A CASE STUDY OF CHATGPT

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Abstract

Academic writing can be challenging for many students despite being vital to education. An academic paper's essential components are time, effort, research, organisation, and coherence. Developing educational writing assistants is to assist students with this process. An opportunity exists to develop further and optimise academic writing and learning. The research employed a qualitative case study. A content analysis review of the ChatGPT case study in academic writing and education was conducted and discussed. The results indicate that ChatGPT is ripe with potential and developing trends. Using ChatGPT, students involved in academic writing could receive personalised recommendations and feedback. The benefits and drawbacks of ChatGPT for academic writing and learning are included in the case study. Aside from the potential biases in the data used to train ChatGPT, educators should also be aware of the technology's limitations. When utilised suitably and in conjunction with other instructional resources and materials without being exploited for inappropriate intentions, ChatGPT possesses the capacity to be a valuable instrument. ChatGPT is helpful but should be assessed for accuracy, dependability, and ethics. ChatGPT shouldn't replace teachers or instruction. When combined with additional resources and supervision, ChatGPT can help teach. ChatGPT-based AI academic writing assistance's strengths and cons have been shown in this paper. ChatGPT's options and trends for building and refining AI-based student writing tools extend with this research.

Keywords: Artificial Intelligence (AI), Academic Writing, ChatGPT, Education, Learning

Introduction

Open AI released ChatGPT, an AI chatbot, in late November 2022. GPT architecture is used. Online chatGPT is contagious. The OpenAI language model powers this chatbot's prompt-based discussions. ChatGPT is great for stories, poems, music, and essays but has limitations. The bot will provide compelling responses to user questions. Several academics prioritise ChatGPT. Administrators form task forces and host institution-wide discussions to address the tools, proposing adoption. ChatGPT stresses the necessity of human-interacting social robots. It evaluates ChatGPT's Robo-Assistant adoption's public impressions, acceptance, and effects. Using AI models and ChatGPT effectively requires friendly robots for human-robot interaction. Due to rapid technological improvement, ChatGPT, an AI-powered chatbot, is employed in education and other fields. Students often like ChatGPT in education because the chatbot answers questions, gives quick responses, and supports them. ChatGPT lets teachers focus on more important tasks by answering common queries. The findings highlighted concerns about ChatGPT's instructional use. The chatbot's accuracy and instructor disengagement scared participants. Privacy and data security were significant concerns. ChatGPT adoption may assist educators and policymakers in deploying it in the classroom. AI chatbot ChatGPT responds with detailed text and voice. These tools raise concerns about academic writing abuse. ChatGPT was recommended for biomedical science academic writing. Although thorough, correct, and innovative, the response lacked academic writing depth. There were poor words, citations, and literary merit. Though restricted, ChatGPT has excellent potential for academic writing training and upskilling. When appropriately used under academic supervision, it boosts the biological intellect. ChatGPT is the most advanced chatbot. Its extraordinary writing speed, unlike chatbots, draws attention and catastrophic predictions. Many predictions exist for higher education student assessment and other areas. ChatGPT, a variant of OpenAI's Generative Pretrained Transformer (GPT) language model, generates human-indifferent writing. Users can interact naturally. Using a documentary approach and content analysis, this critical review analyses ChatGPT in academia, the TAM model's concept and theory, opportunities and trends, benefits, issues, methodology, outcomes, discussions, conclusions, and research implications (McKinsey & Company, 2023; Jangjarat et al., 2023; Limna et al., 2023; Kumar, 2023; Rudolph et al., 2023)

Research Objective

This case study proposes the perspective of ChatGPT adoption in academic writing and education.

Research Questions

1. What are the opportunities and trends of ChatGPT in academic writing and education?

2. What are the advantages and disadvantages of ChatGPT in academic writing and education?

Literature review

ChatGPT in Academics

ChatGPT, Stable Diffusion, and Dall-E text-to-image generators from OpenAI broke records for early public adoption, capital investment, and a technical change that might rival the internet. Generative AI could affect business, art, and culture regardless of deployment. Despite accuracy issues and social and legal considerations, global companies use this technology. ChatGPT could transform academics and librarianship. To develop fresh scholarly information and train future experts, we must use this technology ethically and improve our jobs, not exploit academics. Large Language Models like ChatGPT enable scholars, researchers, and students to create essays, presentations, book summaries, and ideas. In academia, ChatGPT is controversial. The impact on academic research and publication has been investigated. ChatGPT is suitable for academic research. Academic scientists may profit from ChatGPT's early thought generation. Researchers may struggle with literature synthesis, citations, problem descriptions, research gaps, and data analysis. These conditions require attention while using ChatGPT for academic research. Given ChatGPT's potential uses and consequences, educators and scientists must set study and publication requirements. ChatGPT shows that AI authors must meet strict scientific publication criteria (Garon, 2023; Lund & Wang, 2023; Rahman et al., 2023). Copyright, attribution, plagiarism, and authorship are ethical issues in academic AI literature. Many studies attribute ChatGPT, which cannot distinguish AI-generated from human-written work, making these problems crucial. Generative AI may not meet ICME authorship criteria like chatbot consent and responsibility. International Association of Scientific, Technical, and Medical Publishers AI ethical white paper and Committee on Publication Ethical AI editorial decision-making suggestions. We

need extensive authorship policy talks as technologies become more user-friendly and widespread. Elsevier, which publishes the Lancet family of journals, and other significant publishers say AI cannot be an author and must be attributed. ChatGPT's uses, capabilities, and limits showed it might improve economics and finance research. It has been used to examine data, create scenarios, and present conclusions using ChatGPT. Chatbots and similar research tools lack generalizability, data quality and variety, topic knowledge, context understanding, ethics, and unique discoveries. The restrictions of ChatGPT with human analysis and interpretation must be considered. ChatGPT improves student collaboration, engagement, and accessibility, yet academic integrity and plagiarism matter—ChatGPT's pros and downsides in higher education and its dangers and benefits. Literary dishonesty detection and prevention are complex, as are university ethical implementations. It encompasses policy and process creation, training and support, and detection and prevention. Using AI ethically and proactively, universities may address potential and limitations. Academics use ChatGPT, an advanced language model. It helps students and scholars in numerous subjects reply logically and relevantly to circumstances using enormous amounts of information (Liebrenz et al., 2023; Alshater, 2022; Cotton et al., 2023).

Concept and Theory: TAM Model (Perceived Ease of Use and Perceived Usefulness)

The theory technology acceptance model (TAM) concerns consumer technology adoption and use. Actual system utilisation is when people use the tech. Adoption of technology depends on behavioural intention. "Easy to use" refers to the user's subjective opinion of the system's ease of use and time required. User preference for a method that involves minimal effort is perceived as ease of use. It is essential in the early stages of technology acceptance and subsequent use. Simple platforms are more likely to be used. In contrast, perceived usefulness is how much a person thinks technology can improve its efficacy and functionality. It evaluates how technology simplifies service acquisition. Technology use is often affected by positive perceptions of its utility. A person will use technology if they see its benefits. Efficiency, efficacy, task completion, work requirements, and total rewards are closely tied to technology use (Wardana et al., 2022; Limna et al., 2023; Sitthipon et al., 2022; Shaengchart, 2023).

The Opportunities and Trends of ChatGPT in Academics

Academic and health applications for ChatGPT, or GPT-3, have been considered. The time-consuming academic labour can be automated with AI. This brief discussion evaluates ChatGPT's literary strengths and weaknesses. Online data is collected and analysed using the noticing-collecting-thinking process. Research, education, personal skill development, and society explain AI's possibilities and trends. ChatGPT's issues may assist students in understanding emerging technology and growth. It reveals ChatGPT's knowledge gaps, wrong principles, and wasteful practices. However, computer science difficulties must be anticipated and minimised as AI technology evolves rapidly. Natural language processing has been studied in computing for decades. Modern technology created Chat Generative Pre-Trained Transformers and other complicated AI models. These models can solve linguistic problems and respond like humans, promising academic output. ChatGPT and other NLP technologies' ethical implications, legitimacy, and advantages and cons in academic writing and research have been discussed. ChatGPT excites all professions. The Generative Pretrained Transformer (GPT) language model inspired its name. ChatGPT is the most promising AI model since it uses deep learning to produce humanlike text responses. Many sectors have adopted AI technology, demonstrating public trust in it. ChatGPT, based on generative pre-trained transformer autoregressive language models, is widespread and affecting society due to its natural language processing and contextual awareness. ChatGPT could revolutionise hospitality and tourism. ChatGPT will transform the hotel and tourism business by changing how customers study and choose and how companies construct, create, and deliver tailored services and experiences (Islam & Islam, 2023; Dergaa et al., 2023; Wen & Wang, 2023; Gursoy et al., 2023). The conversational AI model ChatGPT from OpenAI caused a sensation. However, AI debates continue. ChatGPT boosted it. If misused, AI may generate mass unemployment and harm science. However, ChatGPT's learning and research potential is fascinating. ChatGPT will continue to impact society regardless of status. AI is transforming our lives, believe it or not. Synthetic biology changed biological research. ChatGPT examines Synthetic Biology and its future studies. Understanding how cutting-edge AI may benefit Synthetic Biology practitioners is crucial (Tong & Zhang, 2023).

ChatGPT improves classroom learning, creativity, and uniqueness. Academic honesty and ChatGPT abuse are moral issues. The findings explain the merits and cons of ChatGPT in higher education and urge educators, researchers, and policymakers to use AI ethically. Higher education is beginning to understand ChatGPT's impact on student learning, teaching, researching, and assessing. The ChatGPT advises educators, academics, and policymakers on

ethically using AI in education (Malik et al., 2023). Thus, ChatGPT mimics natural language processing and offers multiple possibilities. ChatGPT's humanlike responses offer industry-specific solutions. It streamlines and personalises customer service. Virtual tutors can answer educational questions. ChatGPT enhances translation, content, and creative writing. Researchers and developers have developed the concept due to its versatility and promise. ChatGPT trends address biases and promote ethical AI research, including fine-tuning, multi-modal learning, and ethics. As it evolves, ChatGPT could change human-machine interactions and empower numerous sectors.

The ChatGPT's Benefits in Academics

ChatGPT could revolutionise academia. Interactive, personalised explanations can help struggling students understand complex subjects. Teachers can save time and effort using the AI-powered system to provide individualised student feedback. ChatGPT grades and gives students automated input on assignments and exams. ChatGPT can also create new resources and initiatives. It may be utilised to develop more meaningful student engagement games and activities. It can be used to create intelligent instructors that provide personalised education and feedback to pupils as they progress (Kalla & Smith, 2023). Benefits and drawbacks of ChatGPT in teaching and research using big language models. ChatGPT helps with learning assessments, pedagogical practice, virtual personal instruction, outlining, and creativity (Sok & Heng, 2023). ChatGPT could disrupt healthcare education, research, and practice. However, the limitations of this AI chatbot should be considered before using it. ChatGPT cannot write scientific publications unless the ICMJE/COPE rules are changed. Emergency action is needed to involve all healthcare education, research, and practice stakeholders. It will help create an ethical code for academic ChatGPT use (Sallam, 2023).

Future concerns and reassurances concern ChatGPT, a recent artificial intelligence (AI) language model-based application, its use in scientific research and academic works and assignments, and its pros and cons for researchers and students. ChatGPT academic measurements and recommendations to help researchers and publishers reduce plagiarism. ChatGPT can benefit science and academia (Qasem, 2023), and AI tools like ChatGPT can be used in formal exams if used ethically. ChatGPT can teach digital writing composition, co-creating with AI, aiding English learners, and improving Automated Writing Evaluations as these tools evolve. Student usage of these tools poses a significant academic integrity risk since they can develop original, unified work that eludes technical means and expert

academic professionals. Students' revelation of AI tools assesses plagiarism and intellectual honesty. Any educational integrity policy must be updated to account for how students use ChatGPT to determine academic misconduct (Perkins, 2023). Thus, ChatGPT could revolutionise academia by delivering interactive explanations to help students understand complex ideas and personalised feedback to instructors. Grade assignments, create creative learning resources, and instruct intelligently. Due to ethical issues and plagiarism problems, ChatGPT should be used cautiously. It can be helpful in education and research if utilised ethically.

The ChatGPT's Concerns in Academics

Academic integrity concerns, unfair judgment, erroneous information, and AI overuse pose risks. The essay advises using ChatGPT for education and research (Sok & Heng, 2023). In reaction to ChatGPT, some teachers are revising their assignments quickly. How widespread ChatGPT is among students and how harmful it is to learning is unknown. College professors told CNN that some reintroduce in-class essays after years, while others need more personalised ones. Some professors have heard students being assigned brief videos explaining their mental processes. New York City and Seattle public schools ban ChatGPT on district-owned networks and devices for students and teachers (Kelly, 2023). The economic impacts of language models and AI are generally unknown. Productivity increases have changed, displaced, and created jobs, but the long-term repercussions are unknown. We will write more on how to better foresee and shape such effects through policy, but we suggest caution in projecting future labour demand. Thankfully, many education aims (including critical thinking) are unrelated to job preparedness, and we encourage more research on the non-economic consequences of educational interventions (OpenAI platform, 2023). ChatGPT encourages plagiarism and renders researchers and students machine-dependent and unmotivated. AI language model programmes like ChatGPT can be integrated with major publishers and academic platforms to decrease plagiarism and organise the publishing and writing of scientific research and scholarly works to protect researchers and writers (Qasem, 2023). ChatGPT's inaccuracies and information falsification endanger professionalism, ethics, and integrity. ChatGPT's user value is reduced by these restrictions' failure to provide desired results. However, ChatGPT has exciting implications in nuclear medicine teaching, clinical, and research. Redefining norms and information expectations is necessary for ChatGPT implementation (Currie, 2023): academic integrity difficulties, biased judgements, erroneous

information, and AI overuse. ChatGPT is recommended for education and research. Some teachers are changing assignments owing to ChatGPT, although its prevalence and impact are unknown. Some colleges ban ChatGPT. The economic consequences of language models and AI are unknown. Therefore, labour demand forecasts should be cautious. ChatGPT promotes plagiarism and dependency, but academic platforms can avoid it. ChatGPT has limitations and error-prone possibilities, yet it has educational, clinical, and research applications. Redefining norms and information expectations is necessary for ChatGPT.

Methodology

The research employed a qualitative case study for data collection and analysis techniques. This exhaustive assessment of relevant literature included a narrative synthesis. The research synthesis seeks to summarise and clarify the synthesis results using academic writing (Kok, 2023; Kok & Siripipatthanakul, 2023, a). The qualitative research methodology comprises four stages: developing a research plan, collecting data, analysing data, and producing reports. Content analysis is a qualitative methodology using verbal, visual, or written data to describe a phenomenon systematically and objectively (Jaipong et al., 2022). In turn, content analysis facilitates the generation of credible findings. In addition, it is a versatile technique for data analysis that can be applied to systematic qualitative evaluations (Limna & Kraiwanit, 2021; Lim & Siripipatthanakul, 2023). Periodic qualitative evaluations must modify or adapt content analysis methods to be compatible with highly organised and contextualised information to locate knowledge and theory. In conclusion, qualitative content analysis was used in this research (Kok & Siripipatthanakul, 2023, b & c; Limna et al., 2023). The research includes the following steps: The researchers utilised the documentary technique for this case study review. In the first stage, a random sampling of reliable and valid sources was conducted and selected by purposive sampling; in the second step, a content analysis was conducted on the sampled sources using purposive sampling. Five databases were evaluated for this systematic review, including EBSCO, Google Scholar, Scopus, Web of Science, and ScienceDirect. In addition, the inclusion criteria included studies that 1) relate to AI and ChatGPT, 2) are published in English, and 3) were reviewed by four researchers.

RESULTS

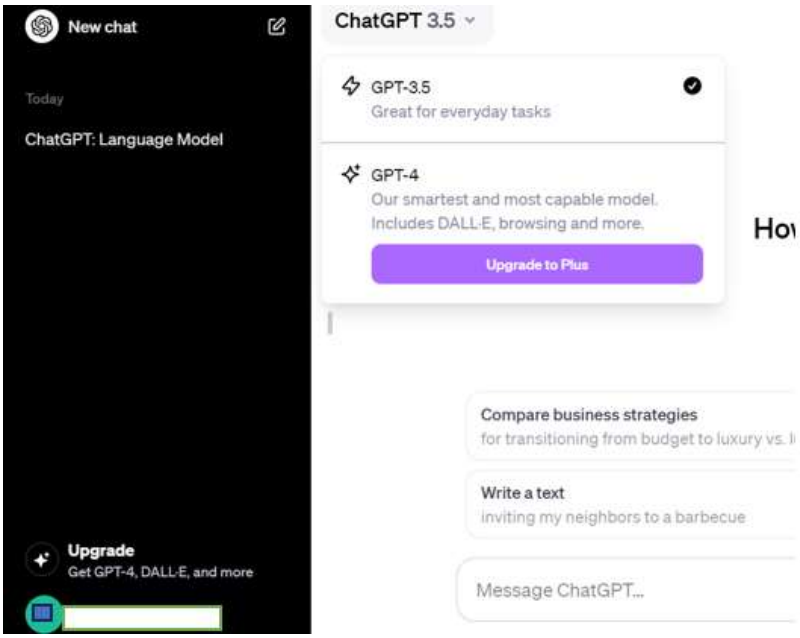

Figure 1: ChatGPT Version 3.5 (2023)

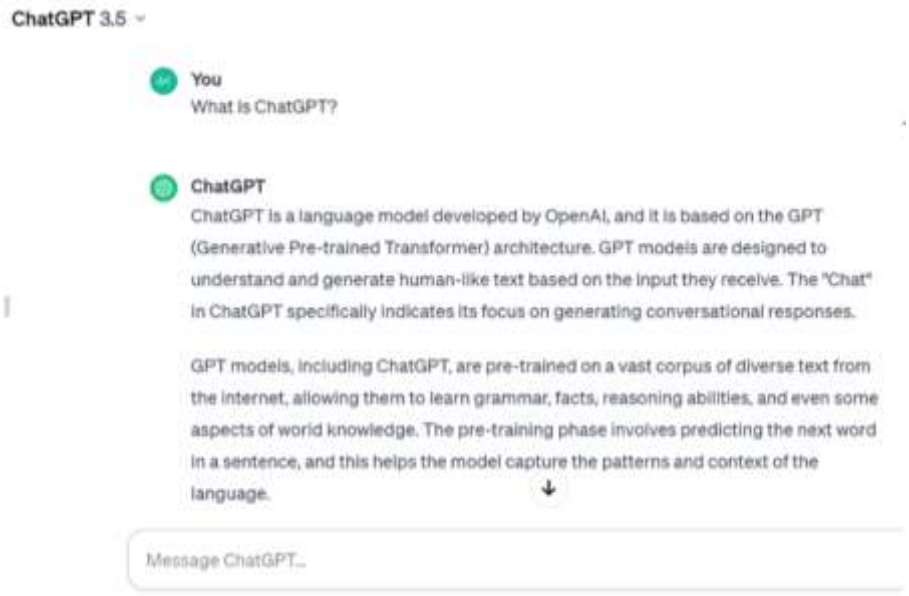

Figure 2: ChatGPT Version 3.5 (2023)

Advantages and Disadvantages of ChatGPT

While ChatGPT has many advantages and benefits, there are also some disadvantages. Here are a few:

Like any AI language model, ChatGPT is subject to biases. These biases can come from the data it was trained on or how it processes information. It is essential to be aware of these biases and to evaluate the information provided by ChatGPT critically. ChatGPT processes language on a sentence-by-sentence basis, which means it may not always

understand the context of a conversation. It can lead to misunderstandings and incorrect responses. ChatGPT cannot understand emotions as humans can. It may not respond appropriately to emotional cues or provide insensitive or inappropriate responses. While ChatGPT can generate grammatically correct and coherent text, its responses may not be creative. It relies on the patterns it has learned from the data it was trained on and may not be able to generate truly original ideas or responses. ChatGPT requires an Internet connection to function. If the link is slow or interrupted, it may not be able to respond quickly or at all.

By following these guidelines, academics could use ChatGPT effectively and minimise the risk of encountering any issues. There are a few things to keep in mind to use ChatGPT effectively and without problems: ChatGPT works best when it clearly understands the question. Try to phrase your questions in a way that is specific and focused. ChatGPT relies on text input, so it is essential to use proper spelling and grammar to ensure accurate responses. ChatGPT is trained on a large dataset, which can contain biases or inaccuracies like any AI system. Be aware of this and take the responses with a grain of salt, especially if the topic is controversial or sensitive. Verifying the data using multiple sources is a good idea if you use ChatGPT to research a topic or find information. ChatGPT can be helpful in learning and research but should not entirely replace human interaction and instruction. Use ChatGPT with other resources and engage with your teachers or peers for a well-rounded learning experience.

These are just a few of the potential disadvantages of ChatGPT. However, it's important to note that many of these limitations can be addressed with continued research and development in AI. There are ethical issues when using ChatGPT or any other AI language model. Here are some examples:

1. Bias and fairness: AI language models can be biased based on the data they were trained on. It means that the responses generated by ChatGPT may reflect and reinforce existing societal biases. It's essential to ensure that the data used to train ChatGPT is diverse and representative of different groups of people.

2. Privacy and data protection: ChatGPT uses user data to function. It includes the text of the conversations as well as user metadata. It is essential to ensure that users' privacy is protected and that their data is not misused or exploited.

3. Responsibility and accountability: When using ChatGPT, it is essential to consider who is responsible for the actions taken based on the information provided by the AI language model. It includes issues related to liability, transparency, and accountability.

4. Dependence on technology: There is a risk that people may become overly dependent on ChatGPT and other AI language models, leading to a lack of critical thinking and decision-making skills. Using these tools as supplements to human reasoning rather than replacements is essential.

5. Misuse and abuse: There is a risk that ChatGPT could be used for malicious purposes, such as spreading disinformation or engaging in harmful behaviours. It is essential to monitor and regulate the use of AI language models to prevent such misuse.

Discussions

According to Prinsloo & Slade (2017), Bender & Friedman (2018), Pears et al. (2019), Lin et al. (2020), Sahito & Jelani (2021), Shrestha & Chapagain (2021), Kalla & Smith (2023), Sok & Heng (2023). Sallam (2023), Qasem (2023), Perkins (2023), Kelly (2023), Qasem (2023) and Currie (2023); the findings confirmed as follows.

ChatGPT's Benefits:

ChatGPT can provide personalised learning experiences for students by adapting to their learning styles, pace, and interests. It can lead to more engaging and effective learning experiences for students. It can improve access to education for students with disabilities or students in remote areas. It can allow them to learn and access educational resources from anywhere with an internet connection. Moreover, it can answer questions quickly and accurately, reducing the time students need to find information and increasing the efficiency of the learning process.

ChatGPT's Negative outcomes:

ChatGPT lacks emotional intelligence and the ability to support students emotionally. It can lead to isolation and disconnection among students who rely heavily on ChatGPT for support. The limited scope of knowledge: ChatGPT is limited to the data it has been trained on, which can result in biases and inaccuracies in its responses. It can lead to students receiving incorrect or incomplete information. However, ChatGPT can be addictive, and students may become overly reliant on it for information and support, leading to reduced engagement with other learning resources and decreased social interaction.

The Possible Issues of ChatGPT Adoption

ChatGPT's computational and resource requirements may limit its use by businesses and people with limited computing resources. The digital gap may result in wealthy people using its features. ChatGPT produces convincing, coherent text. It can be used to create business content, academic essays, plagiarism, and cheating. ChatGPT will probably produce biased or discriminatory content because it was trained on online text that may be biased. Without protection, it can promote harmful preconceptions and discrimination. When abusive or insulting individuals, ChatGPT can perpetuate gender stereotypes and create a hostile online environment. Training data may affect ChatGPT's accuracy and bias. It may spread erroneous information, misunderstanding, and even damage in crucial professions like healthcare, law, and research.

Opportunities and Trends of ChatGPT

ChatGPT supports research, content creation, and challenge-solving, boosting efficiency and productivity. Humans may focus on more complex and inventive tasks by automating monotonous tasks. ChatGPT and similar AI models can level the playing field by providing sophisticated language-based tools to more people as technology progresses and becomes more accessible, notwithstanding capacity limits. ChatGPT facilitates multilingual communication and translation, improving collaboration and engagement between multilingual people. ChatGPT can help kids with homework, research, and learning. It can clarify, answer questions, and provide instructional resources. ChatGPT can personalise customer service, healthcare, and entertainment experiences. Customising replies to consumers' needs and preferences boost satisfaction.

Conclusions

ChatGPT deployment brings several obstacles and possibilities to enhance benefits and reduce drawbacks. Protocols, supervision, ethical protections, and continual efforts to increase precision and decrease bias are needed. ChatGPT offers many academic opportunities. Virtual teaching assistants answer promptly, clarify, and support pupils. Grading can be automated, saving teachers time and giving pupils immediate feedback. ChatGPT helps researchers examine literature, data, and ideas. It simulates language contexts, engages students in discussions, and corrects grammar and vocabulary. ChatGPT simplifies online cooperation, personalised recommendations, and education for impaired students. Academic ChatGPT support must include ethics, user input for iterative modification, learning system

interface, and multilingual. AI needs proper use, and education needs human leadership and understanding. Educational ethics and misconduct must be examined. Language-based AI ChatGPT may respond to inquiries and prompts like people, which may worry educators. This technology could alter education and communication. However, it presents fundamental education technology and student outcomes problems. Some educators worry that ChatGPT may replace teachers or make kids more tech-dependent, impeding critical thinking and problem-solving. Some believe ChatGPT's primary source is biased or inaccurate. These difficulties are valid, but ChatGPT should be utilised conservatively with human supervision. Technology gives pupils new tools and engagement. What teachers and students do using ChatGPT in class influences its effectiveness.

Research implications

ChatGPT is helpful but should be evaluated for accuracy, dependability, and ethics. ChatGPT shouldn't replace teachers or instruction. Student learning and support should improve. The ChatGPT's flaws and data biases should worry instructors. ChatGPT can teach with more resources and supervision. ChatGPT-based AI academic writing assistance's pros and downsides are shown in this paper. ChatGPT's AI-based student writing tool options and trends for better. ChatGPT case study compares user experience to various academic writing assistance solutions. AI-based instructional writing tools may improve. ChatGPT provides individualised literary writing criticism to students and academics. Traditional academic writing help rarely delivers individualised input, making it crucial. This review requires quantitative and qualitative research.

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