

ChatGPT Application in Educational Setting: Benefits and Drawbacks

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Abstract

Artificial Intelligence (AI) has become increasingly popular in education, with ChatGPT and other similar applications becoming well-known learning aids. This review highlights ChatGPT's use in educational settings, looking at both the possible advantages and disadvantages of the technology. Data were sourced from systematic review of literature relating to ChatGPT prospects and challenges in education from various databases including Google scholar, Research gate, Academia.edu, Scopus and the internet. The result from the reviews indicates that positively, ChatGPT improves individualized learning by helping with language comprehension, offering immediate feedback, and responding to intricate questions. It is an additional tool that supports teachers and students, encouraging self-directed learning and accommodating different learning preferences. However, there are also issues with using ChatGPT, such as an excessive reliance on AI, the possibility of false information, and a decline in critical thinking abilities. Its usage is made more difficult by ethical concerns about bias, data privacy, and academic honesty. This study offers a balanced overview of how ChatGPT is changing education through an evaluation of existing literature, emphasizing the necessity for thoughtful implementation to optimize its advantages while resolving its drawbacks. We conclude that ChatGPT should be engaged as a supplementary resource for education rather than an apparatus for substituting critical thinking or performing educational tasks without applying the necessary mental effort required for teaching and learning.

Keywords: ChatGPT, Artificial Intelligence, Education, Personalized learning, Plagiarism, Academic integrity, Educational technology.

Introduction

Artificial intelligence (AI) has become an essential part of everyday human operations. AI technologies provide exciting capabilities that are being applied in a variety of fields to improve efficiency and performance. One important area that AI is fast gaining prominence is the education sector (Onyema *et al.*, 2020). The adoption of AI in education has helped in the creation of revolutionary tools and methodologies that can change higher learning (Kılınç, 2023). Many AI powered software and hardware and other educational technologies have been developed and adopted by educational institutions to manage their academic processes including admission, administration, assessment and grading, training and student performance monitoring, and campus security. The recent introduction of AI-based Chatbots especially the ChatGPT App has further amplified the impact of AI in education. Generative Pre-trained Transformer (ChatGPT) is a product of Artificial intelligence that has brought transformation to the human society. Since the introduction of the technology in year 2022, ChatGPT has continued to generate a lot of reactions and narratives across the world. The incorporation of ChatGPT into the educational sector has elicited significant attention and excitement (Yu *et al.*, 2024). The technology has the capability to assist users in writing and also getting real-time feedback from queries. It exhibits significant developmental possibility, which could instigate substantial transformations in education and exert a considerable influence on advanced instructional methodologies.

ChatGPT possesses several capabilities, including the simulation of natural dialogue, composition and troubleshooting of software, provision of answers to examination questions, and essay writing (Edwards, 2022). Sarin and Kimkong (2023) and Onyema *et al.* (2022) argued that the technology has become important educational tool that assist staff and students in essay writing and assessments. Millions of people now rely on use of ChatGPT for their essay writing skills and generation of new concepts (Mogali, 2023). The inherent features of ChatGPT make it an asset that can be leveraged by educational institutions to enhance their activities. Artificial intelligence driven Chatbots can be used productively by teachers to prepare lecture notes and learning assessments much easier compared to the traditional approach (Zhai, 2023). Learners can easily quick responses and better understanding of abstract concepts using ChatGPT (İpek *et al.*, 2023). Although, the answers generated from AI-driven chatbots might not always be the best or entirely accurate but they

offer supportive solutions to independent learners. The emergence of ChatGPT is helping distance and inclusive education. This is because the application can easily be accessible by different kinds of learners at any location, and answers can be provided on variety of questions in different fields by App. Thus, ChatGPT brings education closer to the disadvantaged, and can also promote students' reading skills and inquiry. Ma and Huo (2023) believed that ChatGPT could potentially catalyze access to education and also improve students learning styles. However, in spite of the perceived benefits of ChatGPT, there are concerns about allowing the use of the technology in schools. The growing acceptance and influence of AI tools and applications among students and teachers present both changes and challenges to the education industry, and many education authorities are now grappling with these new realities.

There are fears that the fundamental premise of education which has to do with critical thinking, creativity, problem solving and individual development may be hampered by total reliance on machines or use of tools like the ChatGPT. For instance, some Scholars believe that unregulated or excessive use of ChatGPT and other AI tools in schools could affect the creative and problem-solving skills of learners as well as their productivity and employability after school (Edeh *et al.*, 2022; Gordijn, and Have, 2023; Cotton *et al.*, 2023).

There is no doubt that ChatGPT have enormous potentials in pedagogy but the rising concerns about its negative consequences especially on cognition and creativity of students, knowledge and inquiry skills, learning culture and academic integrity poses a strong challenge to its widespread adoption at different levels of education. Despite the expanding number of studies on ChatGPT, there is still a limited knowledge about its implementation in educational settings. Thus, this review tries to fill that gap by examining its present and futuristic impact on education particularly as regards its benefits and harmful effects. The outcome could assist policymakers and colleges to formulate strategies to maximize the potentiality of ChatGPT and also mitigate its adverse effects.

Review of Closely Related Work

A Chatbot is cutting-edge computer software that acts as virtual assistance and also mimics human interactions through textual or voice interfaces. Chatbots are utilized extensively in numerous large-scale applications (Terrance and Meer, 2022). The idea behind Chatbot

development was to give users rapid answers to queries in order to increase efficiency and quality of conversations. There is an increasing amount of research into the usage of Chatbots in education. Academics are continuously researching the most effective strategies to maximize the benefits of ChatGPT while addressing potential difficulties to the educational sector. Table 1 provides a review summary of previous works relating to this study:

Table 1: Summary of Related Works

Authors/Year	Research Title	Conclusion
Sarin and Kimkong (2023)	ChatGPT for education and research: A review of benefits and risks.	The study highlighted the various benefits of ChatGPT in education, and also expressed concerns regarding academic integrity issues and inaccuracies of feedbacks
İpek <i>et al.</i> (2023)	Educational Applications of the ChatGPT AI System: A Systematic Review Research.	The review disclosed the vital uses of ChatGPT in classroom settings and the possible adverse effects of its implementation.
Yu <i>et al.</i> (2024)	ChatGPT in higher education: factors influencing ChatGPT user satisfaction and continued use intention.	The study affirmed the high penetration of ChatGPT in higher education, and participants also acknowledged its compatibility and usefulness in their educational activities.
Kasneci <i>et al.</i> (2023)	ChatGPT for good? On opportunities and challenges of large language models for education	The researchers indicated that ChatGPT could aid educational activities but it could negatively reduce the problem-solving skills of students.
Montenegro-Rueda <i>et al.</i> (2023)	Impact of the Implementation of ChatGPT in Education: A Systematic Review	The study concluded that ChatGPT will impact education positively in many ways
Halaweh (2023)	ChatGPT in education: Strategies for responsible implementation.	The study advocated for use of ChatGPT in education, and also suggested strategies for its successful implementation in school settings.

Dempere <i>et al.</i> (2023)	The impact of ChatGPT on higher education	The study found that ChatGPT at colleges was advantageous as it supports research, and writing skills of students. However, it also pointed out some challenges such academic fraud and machine related errors.
Kılınç (2023)	Embracing the Future of Distance Science Education: Opportunities and Challenges of ChatGPT Integration.	The study emphasized the value of ChatGPT in remote learning and suggested that curriculum and educational regulations be reviewed to facilitate the inclusion of ChatGPT into online science education.
Daev <i>et al.</i> (2023)	Explored the merits, limitations and future prospects of ChatGPT in Medicine	The study observed that ChatGPT have features that could enhance understanding of concepts by medical students and researchers. However, they suggested the need for a framework to regulate the use of AI-generated content to avoid misuse.
Adeshola and Adepoju (2023)	The opportunities and challenges of ChatGPT in education.	The study found that the majority of people thought ChatGPT was an effective instructional tool. However, they cautioned about its negative implications, such as fraud in assignments

The Concept of ChatGPT

ChatGPT is an AI-based Chatbot powered by Natural Language Processing (NLP) algorithm that can simulate human-like conversation between users (Dempere *et al.*, 2023). The application functions as an artificially intelligent or virtual assistant that can respond to questions speedily and more precisely. It was developed by OpenAI in November, 2022. ChatGPT is designed to understand natural language and generates insightful and appropriate solutions to user enquiries (OpenAI, 2022). The application quickly gained global attention after its introduction due to massive adoption of the technology and its features. Statistics show that more than 1.5 billion users visited ChatGPT desktop and mobile platforms in February, 2024 (Sudarshan, 2024). This is an indication that the application has continued to

receive interest from users across the globe compared to other similar Chatbots. The primary distinction between ChatGPT and other existing algorithms is its ability to produce responses that resemble natural user input and to comprehend and respond to users' inquiries in a natural manner. It can also be customized for certain applications or domains, showcasing a model that reacts to user input in a dialogue-like setting. Moreover, ChatGPT may offer thorough responses to challenging queries, enabling users to swiftly and effectively obtain the knowledge they require (Yu *et al.*, 2024). The rising number of people using ChatGPT proves that the technology has gained large acceptance in many parts of the world, and it can indeed be integrated into education.

ChatGPT features make it very useful to many students and educators but it is also prone to misuse. Figure 1 shows the home screen (interface) of ChatGPT mobile platform. Constant use of ChatGPT could lead to academic laziness and possible addiction. When users are addicted to use of AI aids for task completion especially education related assignments, it could affect their cognition and creative abilities. ChatGPT is not supposed to replace the students' efforts in learning programmes, rather it should be treated as teaching and learning tool to improve efficiency and performance such as writing and communication skills. While we are not supportive of outright ban of ChatGPT by educational institutions, it is important to note that its use by students and teachers requires some regulations to avoid eroding the fabrics of education especially as it regards critical thinking. Allowing students to rely totally on ChatGPT app could affect both their mental, emotional, psychological and creative capacity. If the use of ChatGPT becomes a habit for students and teachers, it could promote academic fraud and also placement. Merits could be affected as some undeserving students could leverage the technology to outperform their colleagues that perform their tasks by themselves without ChatGPT. Also, there are concerns regarding security and data privacy in using ChatGPT and other AI technologies (Onyema *et al.*, 2021). The use of generative AI models like the ChatGPT enhance the generation of wide range of contents, some of which could be illogical (Daev *et al.*, 2023). Therefore, the technology has to be used with caution when allowed in schools.

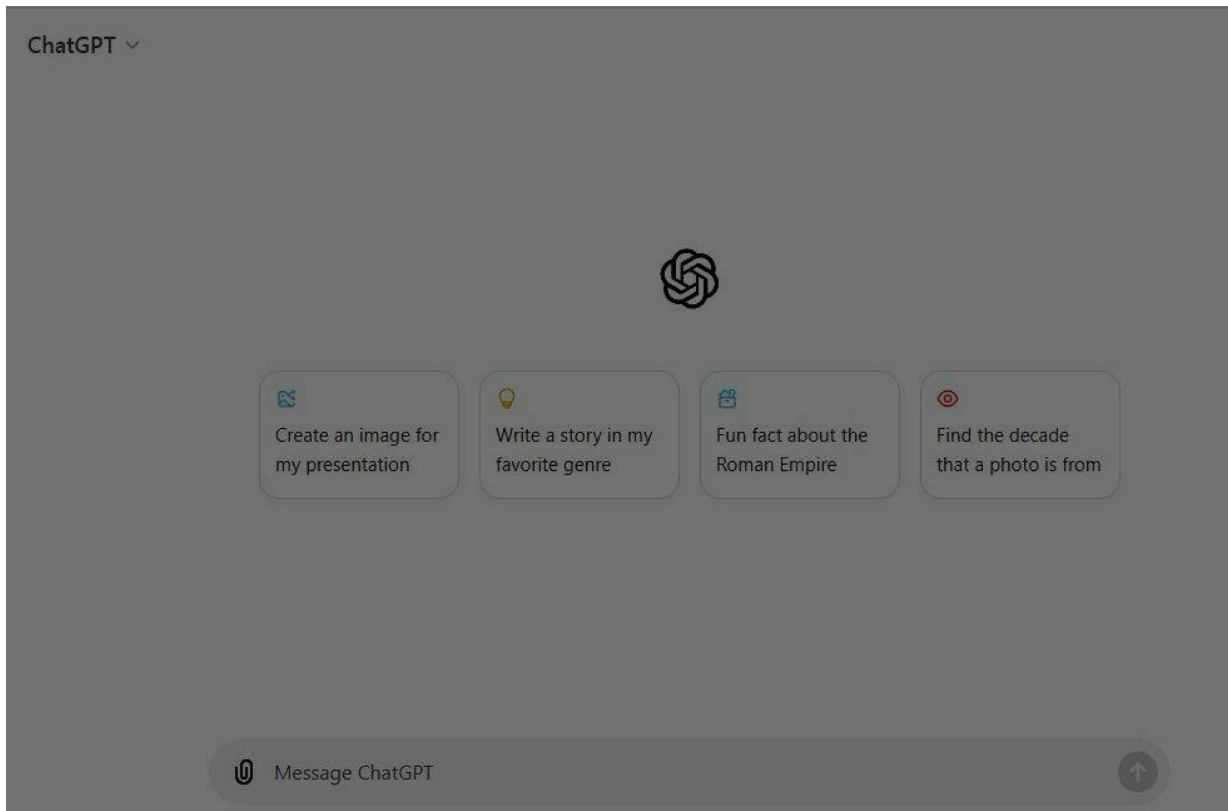


Figure 1: ChatGPT's home screen

Data Sources

The Researcher conducted rigorous search of previous studies and publications relating to ChatGPT application in educational settings in order to gather data for the review. Some of the notable channels where materials were sourced include Google scholar, Researchgate, Academia.edu, PubMed, Scopus and the internet generally.

Benefits of ChatGPT in Educational Settings

ChatGPT has developed as a promising technology for improving the student's experience and increasing student-teacher engagement (Montenegro-Rueda *et al.*, 2023). ChatGPT can capture the intricate details of human language, enabling it to provide acceptable and appropriately situated responses to a wide range of requests (Dave *et al.*, 2023). The usage of ChatGPT for educational purposes has received a lot of consideration because of its ability to improve students' learning experiences. This method can target specific student needs, provide fast feedback, and aid in the comprehension of complicated concepts by offering

quick and tailored solutions. As a result, it becomes a potential instrument that supports a student's active participation and cognitive advance by adapting to their study pace and providing ongoing help in their information acquisition process (García *et al.*, 2023). ChatGPT can help schools enhance their relationship with students by giving students immediate assistance with Chatbots. ChatGPT's natural language processing (NLP) features allow it to reply to student queries, concerns, and admission details requests in a timely and effective manner. It gives smart and specific responses to student queries and also provides them with pool of information regarding a topic (Halaweh, 2023). It facilitates personalized learning and can stimulate learners' interest in education. The use of ChatGPT has also been found to improve the access and productivity of Distance education (Kılınç, 2023). A study by Abbas *et al.*, (2024) discovered that students who are faced with more workloads and time constraints were more inclined to engage with ChatGPT. Some of the benefits of ChatGPT application in educational settings are summarized in Table 1.

Table 1: Summary of ChatGPT Benefits in Educational Setting

Summary of ChatGPT Benefits in Educational Settings

- Provision of meaningful responses for wide range of queries (Dave *et al.*, 2023).
 - Assist or act as guide in improving users' writing skills and knowledge (Mogali, 2023).
 - Enhanced access to variety of relevant educational contents (Ma and Huo, 2023).
 - Personalized learning environment
 - Support student learning experience and inquiry (Yu *et al.*, 2024)
 - Catalyst for research and content creation (Dempere *et al.*, 2023)
 - Promote inclusive and distance education (Kılınç, 2023)
 - Aid tailored feedbacks and student's understanding of concepts
 - Generate materials for lecture note and assignment preparation (Halaweh, 2023)
 - Real-time guide for curriculum design and development
 - Facilitate online education and Professional Development
 - Recommends alternative approaches for problem-solving and teaching techniques
 - Virtual assistant for students and teachers
 - Stimulate students' participation in academic discourse
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Drawbacks of ChatGPT in Education

The emergence of ChatGPT has introduced a new challenge to the education sector globally. Notwithstanding the promise advantages of ChatGPT and other AI techniques, researchers have argued that the adoption of ChatGPT may have several negative repercussions for both students and teachers (Dave *et al.*, 2023; İpek *et al.*, 2023). Some even regards the usage of ChatGPT for educational related tasks as immoral (Adeshola, and Adepoju, 2023; Dwivedi *et al.*, 2023). ChatGPT spreads disinformation or generates harmful content that can fuel may fuel ethnic or religious tension. ChatGPT introduction has triggered changes in assessment techniques used by universities as efforts are being made by some of them to explore alternative evaluation methods (Adeshola and Adepoju, 2023). This is because many critics believe that the technology presents unique obstacles to examination integrity. Baidoo-Anu and Ansah, (2023) argued that ChatGPT could be very harmful and deceitful with inaccurate answers. According to Kasneci *et al.*, (2023), using ChatGPT can have a damaging effect on students' growth of fundamental skills, such as analytical thinking. Similarly, Dempere *et al.* (2023) warned that poor regulation of ChatGPT in higher education institutions could fuel academic cheating and AI-induced anxiety and other generational impacts such as job displacement and poor creativity. Mortadella *et al.* (2021) claimed that Chatbots lack important human characteristics such as empathetic thinking reasoning, and confidentiality. The fears associated with ChatGPT have prompted several educational institutions to take draconic measures to mitigate its use in classroom. For instance, some schools have banned the use of ChatGPT by their students during school hours, and while some others have reviewed their methods of examinations and testing to minimize students' use or reliance on ChatGPT for assignments and examinations. Despite the concerns on the limitations of ChatGPT, the technology could help to change teaching and learning in a positive when if properly utilized. Thus, there is the need for institutional regulations to promote the use of ChatGPT and other related education technologies in order to harness their potentials and also ensure responsible use by educators and students. The summary of the limitations of ChatGPT implementation in education setting is given in Table 2.

Summary of ChatGPT Drawbacks in Educational Settings

- Violation of copyright laws (Dave *et al.*, 2023)
 - It can stimulate examination malpractice (Adeshola and Adepoju, 2023)
 - Ethical and credibility problems (Van Dis *et al.*, 2023)
 - Plagiarism and Academic integrity issues (Biswas, 2023)
 - Inaccuracies and misinformation (Sarin and Kimkong, 2023)
 - Tendency to negatively impact student's performance and intellectual development (Korn and Kelly, 2023).
 - Threat to creativity and critical thinking in education (Dwivedi *et al.*, 2023)
 - Excessive use of ChatGPT can lead to academic laziness (Abbas *et al.*, 2024).
 - Overreliance on ChatGPT by students and educators (Kasneci *et al.*, 2023).
 - Risk of reduced mental activity and memory loss (Bahrini *et al.*, 2023; Abbas *et al.*, 2024)
 - Masking learning difficulties or at-risk students (Grassini, 2023).
 - Data security and privacy issues.
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Table 2: Summary of ChatGPT Drawbacks in Educational Settings

Despite the aforementioned challenges in table 2, we believe oppose the idea of outright ban on use of ChatGPT by educational institutions. Consequently, it is suggested that school authorities can lessen the negative consequences of ChatGPT while still promoting intellectual honesty by setting explicit regulations and procedures that would guide the use of the technology in school.

Conclusion

The review highlights ChatGPT prospects in education sector as well as concerns of stakeholders regarding its application in schools. Results from several articles reviewed shows that many scholars welcome the use of ChatGPT by educational institutions, students and teachers. The summary of the identified benefits of ChatGPT in education as outlined in the various reviewed literature include Writing and report generation, research and data analysis, lecture note preparation, testing and evaluation, customized learning assistance and

improved learner experiences, curriculum development support, digital literacy support, massive open online education contents, and automated grading and assessment. In spite of the growing merits of Chatbots in education, the reviews revealed that there is increasing concerns about its drawbacks such as academic integrity issues including examination malpractices, privacy and plagiarism, inaccuracies of Chatbot answers, algorithmic errors or bias, hallucination issues, and misinformation. It is our believe that ChatGPT and other emerging AI tools are positive educational instruments that could play a crucial role in improving the quality and productivity of education, but it requires regulation to prevent misuse by both teachers and students. Considering the speed of ChatGPT penetration and the increasing power of AI, educational institutions must brace up for the changes and challenges that ChatGPT and other emerging education technologies will bring to the education sector. We suggest that ChatGPT should be used as a supportive instructional tool rather than a replacement for critical thinking or vital mental efforts required for effective teaching and learning.

Future Work

Future studies can examine the influence of ChatGPT on creativity and critical thinking of students. Researchers can also develop a framework to guide schools to ensure responsible integration of ChatGPT in their teaching and learning process.

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