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An Evaluation of ChatGPT in Education

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Annotation: ChatGPT is a powerful and versatile artificial intelligence (AI) language model, which has been widely used in the field of education. It has been developed to assist in text generation, translation, and data analysis tasks. The research is based on a systematic review of the literature and a SWOT analysis to assess the technology's strengths and weaknesses and identify opportunities and threats within the education sector. This study aims to determine the internal and external factors that impact ChatGPT's success in education. This research will help shape the future of technology-assisted learning and inform policy decisions on using these technologies in educational settings.

Keywords: ChatGPT; Swot analysis; Artificial intelligence; Education; Technology.

INTRODUCTION

In recent years, the landscape of scientific research has been transformed by artificial intelligence (AI) and machine learning. Chatbot technology has made tremendous strides, with ChatGPT emerging as a powerful and influential AI language model (PP Ray,2023).

In the digital age, self-motivation, resourcefulness, and self-directed learning are key attributes sought by employers and academicians. Self-directed learning involves learning independently, using open resources, and empowering individuals to take control of their learning journey; personalized education enables them to learn at their own pace and customize their education to their unique needs.

Recent reports suggest that OpenAI's Chat GPT has gained a million users and is considered a significant advancement in AI technology. Its potential to aid self-directed learning is immense, and much must be explored. This research can help shape the future of technology-assisted learning and inform policy decisions on using these technologies in educational settings (Som Biswas, 2023).

OpenAI, the esteemed American AI research laboratory, confidently launched the game-changing Generative Pre-trained Transformer (ChatGPT) in November 2022. This revolutionary AI tool utilizes large language models to assertively generate detailed responses to prompts and follow-up questions at lightning-fast speeds (Sok, S. and Heng, K., 2023). The ChatGPT tool has been a huge hit, with 100 million users within two months of its launch in November 2022 (The Guardian, 2023). OpenAI has launched a new subscription plan for £20/month. Subscribers get unrestricted access to ChatGPT and faster response times.

Understanding the origins and development of ChatGPT is crucial to appreciating its role in advancing scientific research. ChatGPT comes from the field of NLP, a branch of AI that aims to enable machines to understand and produce human language. ChatGPT was created to develop a highly advanced and versatile AI language model to assist in text generation, translation, and data analysis tasks. ChatGPT is rooted in the development of the Transformer architecture. It was created to address problems with earlier sequential natural language models, including Recurrent Neural Networks and Convolutional Neural Networks (PP Ray,2023).

LITERATURE REVIEW

AI was founded by philosophers who tried to explain human thinking as manipulating symbols, leading to the development of the programmable digital computer in the 1940s. AI research was established in 1956 at

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Dartmouth College, where attendees believed that a machine as intelligent as a human would exist within a generation and were granted funding. However, creating such a machine was much more complicated than they first thought, and funding was withdrawn in 1974. After the "AI winter," the Japanese government launched an initiative in the early 1980s that sparked renewed interest in AI and funding. The 21st century saw continual new developments in AI, with a surge in investment and interest as machine learning was applied to various problems using new techniques, powerful computers, and massive datasets (İpek, Z.H; et al;2023).

Emergence of ChatGPT

ChatGPT is a sophisticated natural language processing system created by OpenAI. It can generate lifelike conversations by accurately comprehending the context of a given conversation and crafting fitting responses. This outstanding technology is powered by a deep learning model called GPT-3, which has been expertly trained on a vast dataset of conversations (Deng & Lin, 2022).

ChatGPT is a highly advanced NLP system with abundant cutting-edge features. It has the remarkable ability to understand even the most intricate details of a conversation and provide fitting and precise responses. With its multilingual proficiency, ChatGPT can generate responses in English, Spanish, French, and German, making it a versatile tool for communication. Moreover, it can generate responses in various styles, such as formal, informal, or humorous, with utmost accuracy and ease, ensuring seamless and effective communication (Deng & Lin, 2022).

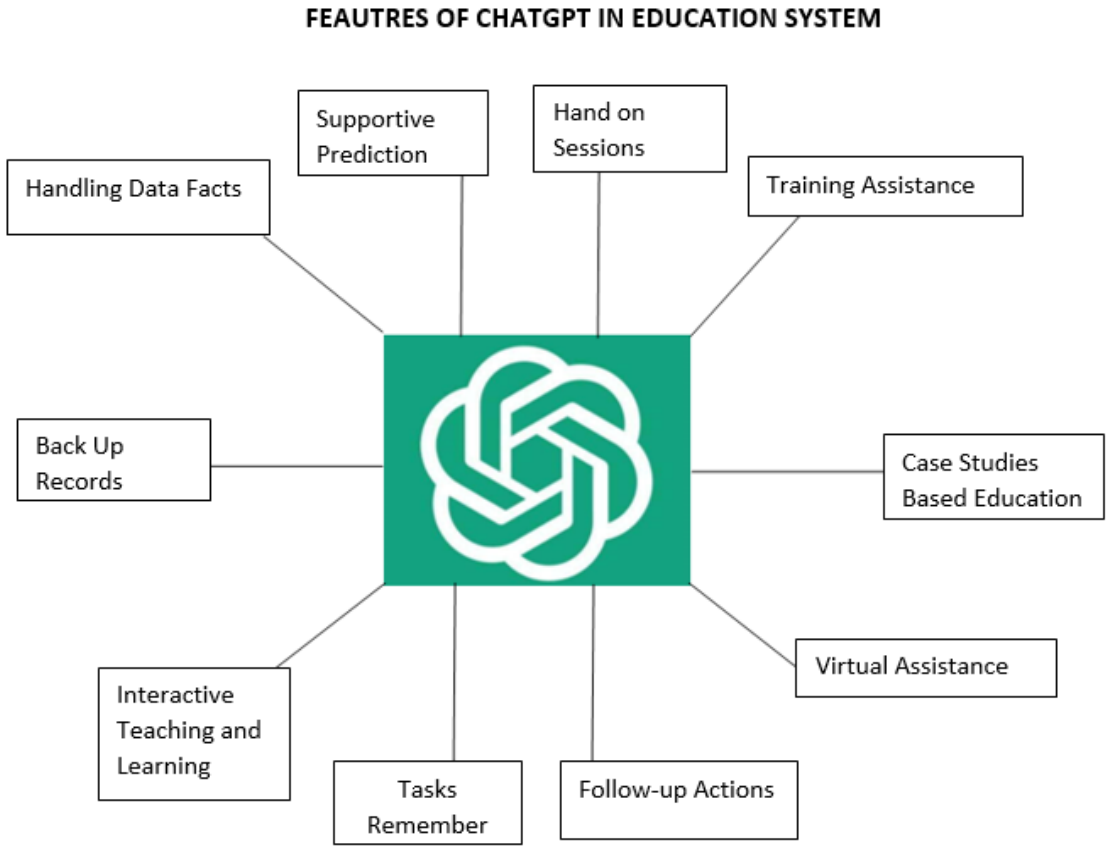

Figure.1

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ChatGPT is an impressive tool with various capabilities and features to support education. Among its many functions is the ability to retain information, make predictions, and generate translations. A detailed overview of ChatGPT's diverse attributes and viewpoints can be found in Fig. 1. As technology continues to evolve in the field of education, only a select few innovations are successfully integrated into the system. ChatGPT offers students a range of problems to collaborate on, or they may choose to work independently to solve these challenges.

Students can benefit from using ChatGPT, as it helps improve their questioning and critical thinking skills by teaching them to formulate precise questions. ChatGPT also expands their knowledge by providing answers and teaches them to assess the accuracy, reliability, and quality of the answers it provides. Additionally, it helps students filter relevant information from the answers given. This technology is versatile and can be applied to various natural language processing applications. ChatGPT is a flexible tool that responds to instructions with high accuracy and fluency, but it requires a thorough understanding of the world and the ability to think like a person (M. Javaid, A. Haleem, R.P. Singh, et al, 2023).

Role of ChatGPT in Education

The ChatGPT chatbot's launch has prompted both educators' admiration and concern. Scholars are sharing their predictions about the program's capabilities and potential consequences due to its ability to accurately perform a wide range of tasks. These tasks include writing articles, answering complex questions, translating languages, solving mathematical formulas, producing programming code, and summarizing books. As a result, the program has been tested in various fields such as law, pharmacy, medicine, and language education and has received scores higher than those of an average student (İpek, Z.H; et al;2023).

To gain a comprehensive understanding of ChatGPT, the researcher has formulated a set of research questions to examine the current state of the published literature.

Q1: Discuss the SWOT analysis of ChatGPT in education.

Q2: What are the benefits and challenges of integrating ChatGPT with education technology, and how does it impact learning outcomes?

METHODOLOGY

At the time of writing, a systematic literature review was conducted to gain a concrete and detailed understanding and interpretation of artificial intelligence. A systematic review follows a rigorous and structured approach to reviewing all relevant literature on a specific research question. It employs clearly defined methods to identify, select, and critically appraise relevant research. Then, it collects and analyzes data from the studies included in the review (Higgins & Green, 2011).

While conducting a systematic review the researcher used Google Scholar to access articles on ChatGPT, selecting recent publications. Articles were selected from credible databases including Science Direct, Eric, SpringerLink, Sage Journals, Taylor & Francis Online, MDPI, and JSTOR.

The researcher thoroughly searched articles related to ChatGPT in relevant databases. Since the subject of ChatGPT is considered very current, attention was paid to selecting the first publications. The researcher carefully selected research studies relevant to ChatGPT and analyzed the data from those articles. After analyzing the data, summarized the findings and interpreted them to make the best sense of the research. Additionally, the researcher made sure to correct any spelling, grammar, and punctuation errors to ensure clarity.

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RESULTS

Chatgpt SWOT Analysis in Education

SWOT analysis is a valuable decision-making tool that helps identify a particular domain's strengths, weaknesses, opportunities, and threats. In the case of ChatGPT, a SWOT analysis can evaluate its technical capabilities, acceptance within the education sector, and readiness of stakeholders. This study aims to use SWOT analysis to determine the internal and external factors that impact ChatGPT's success in education. It will assess the technology's strengths and weaknesses and identify opportunities and threats within the education sector.

Strengths ✓ It is both free and user-friendly. ✓ Rapidly combines information. ✓ Saves time by summarizing results from many sources. ✓ Generates new content and is easy to read.	**Weaknesses** ✓ The absence of a thorough comprehension or knowledge. ✓ It is challenging to assess the standard of answers. ✓ The potential for prejudice and unfair treatment. ✓ Lack of critical thinking abilities.
Opportunities ✓ Making information more easily available. ✓ Assisting in personalized learning. ✓ Assisting complex learning. ✓ Reduces the workload of teaching and learning.	**Threats** ✓ Lack of understanding of the context. ✓ Academic integrity is at stake. ✓ Rise in plagiarism. ✓ Fall in high-order cognitive skills.

Figure. 2

Benefits of ChatGPT

1. **Increased Efficiency:** ChatGPT can enhance efficiency by automating conversations, thereby avoiding the need for manual interactions, and leading to a saving of both time and resources. Moreover, this technology can be useful in the elimination of cluttered or unnecessary conversations. ChatGPT facilitates swift communication by generating quick replies.
2. **Improved Accuracy:** ChatGPT has been proven to help you create more accurate responses than manual conversations due to its extensive training on a large dataset of conversations, enabling it to understand the context of the conversation and respond appropriately.
3. **Budget Friendly:** ChatGPT is an innovative language generation model created by OpenAI, which has the capability to substantially reduce expenses for businesses that depend on chatbots for customer service. One of the primary advantages of ChatGPT is its ability to create responses that resemble human beings in real-time, therefore diminishing the need for expensive human customer service employees.
4. **Consistency:** ChatGPT can provide consistent responses and follow predefined rules, ensuring uniformity in interactions.
5. **Efficient Communication:** ChatGPT can enhance communication within teams, helping to clarify ideas, draft emails and improve written communication.

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Challenges of ChatGPT

1. **Lack of common-sense understanding:** ChatGPT may offer answers that sound plausible but are factually incorrect or lack logical reasoning. It operates without any real understanding and is dependent on patterns in its data sources, which may not be reliable on a consistent basis.
2. **Bais in responses:** Due to the often biased or politically sensitive nature of textual data on the internet, efforts continue to mitigate potential bias in ChatGPT's responses. However, achieving complete objectivity is still a significant challenge**.**
3. **Inappropriate content:** ChatGPT can generate offensive, harmful, or inappropriate content that may lead to misuse or unintended harm without proper safeguards and moderation.
4. **Legal and Regulatory Challenges:** Legal and regulatory issues of responsibility, accountability, and liability for misuse or harm arising from the use of AI models such as ChatGPT.
5. **Environmental Impact:** The training and deployment of AI models such as ChatGPT consumes a significant amount of energy resources, contributing to environmental concerns.

CONCLUSIONS

Before implementing ChatGPT in the education sector, it is crucial to address several challenges. Therefore, we recommend the following actions:

- ✓ Establish an AI department with teams of data scientists and domain experts to manage ChatGPT and provide training and support.
- ✓ Ensure the educational institution has the necessary infrastructure to support ChatGPT's use.
- ✓ Determine compatible integration platforms and applications.
- ✓ Establish standards for security and quality, including guidelines and protocols for handling and storing sensitive data.

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