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AI Chatbots as Transformative Tools in Education: A SWOT Analysis of ChatGPT

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ABSTRACT

ChatGPT is a cutting-edge natural language processing model, is deliberated to recognize and create human-like text based on the command it receives. It uses massive datasets to pre-train its language understanding skills, working on deep learning concepts. The learning process is taken to new heights by using this advanced AI conversational tool in the classroom, providing teachers and students with exceptional chances for development and cooperation. Several studies are going on to uplift the use of AI tools like chat GPT in the facet of Education. Like every innovation, the stakeholders enjoy the benefits of ChatGPT for different purposes. However, we should be aware of the negative impact of AI tools and take care when it is implemented in the arena of teaching, learning, evaluation, and research. ChatGPT offers tutoring assistance, assistance for language learning, quick information access, etc. It also lacks real-time information, verification of information, proper understanding of context etc. So, there is a need to have a proper understanding of the AI tool, ChatGPT, and thorough research before adopting it as a learning platform. Therefore, the present study focuses on the strengths, weaknesses, opportunities and threats of ChatGPT in Education.

Keywords: ChatGPT, Artificial Intelligence & Education

INTRODUCTION

ChatGPT is a type of GPT (Generative Pre-Trained Transformer) developed by OpenAI, an artificial intelligence research organization based in San Francisco, California and it was first released in the year June 2020. OpenAI was founded by Sam Altman, Elon Musk, Greg Brockman, Peter Thiels and others. OpenAI develops different models other than GPT. ChatGPT is a natural language processing (NLP) system designed to create human-like communication by understanding the milieu of a conversation and generating the most suitable responses. The phrase ChatGPT is a mixture of two terms: Chat, which describes the program's capacity to mimic human interaction, and GPT which stands for Generative Pre-Trained Transformer (Singh, et.al., 2022). ChatGPT is created on a deep learning model called GPT-3, which is pre-trained on a large dataset of conversation. It responds to user inquiries in natural language using machine learning techniques. To understand natural language patterns and replies, it is trained on massive datasets of conversations and other text sources. It processes conversations and produces responses using an encoder-decoder paradigm. The conversational setting and the user's inquiry inform the generated responses. It is intended to be very conversational and react organically. It can also adjust to user preferences and recall previous discussions. It is available in various applications, including chatbots, virtual assistants, language translation tools etc. GPT technology can transform how humans interact with and interpret language. It is a major leap in the field of natural language processing.

Chat GPT is a tremendous tool that has the potential to change the way we interact with technology completely. It is now being investigated for use in education to improve student learning and engagement. GPT models can be used in several ways for education such as language learning, personalised learning, automatic grading, learning assistance, research assistance, classroom discussion etc. Many natural languages processing applications, including question-answering systems, text summarisation, and language translation, can be handled using GPT. GPT-based resources and exercises can be applied in the classroom to produce writing exercises, offer criticism on students' work, or even design individualised learning programmes.

EVOLUTION OF CHATGPT

OpenAI is one of the prestigious Artificial Intelligence Research facilities that developed the GPT (Generative Pre-Trained Transformer) sequence of language models. The architecture of the transformer was utilised for training GPT-

1, the initial GPT model released to the public in 2018. It was the first stepping stone of OpenAI; a substantial quantity of text data was used to train it. Later models in the series outperformed GPT-1, which was very good at natural language processing tasks like question answering and language translation. With its 2019 introduction, GPT-2 showed cutting-edge performance in a variety of language tasks, with text production. An even bigger dataset served as its training set. GPT-3, a larger model that was trained on a vast dataset of over 45 terabytes of text data, was released in 2020. It demonstrated proficiency in a range of natural language processing tasks, such as question answering, summarization, and language translation. It also produced remarkably human-like prose. ChatGPT is one of the numerous GPT-3 applications developed specifically for conversational AI. ChatGPT 4 is the updated version of GPT that is availing now at a paid cost. ChatGPT 3.5 is the available free version. it is updated and provides information till 2023 at free of cost. The figure 1 highlights the evolution of ChatGPT.

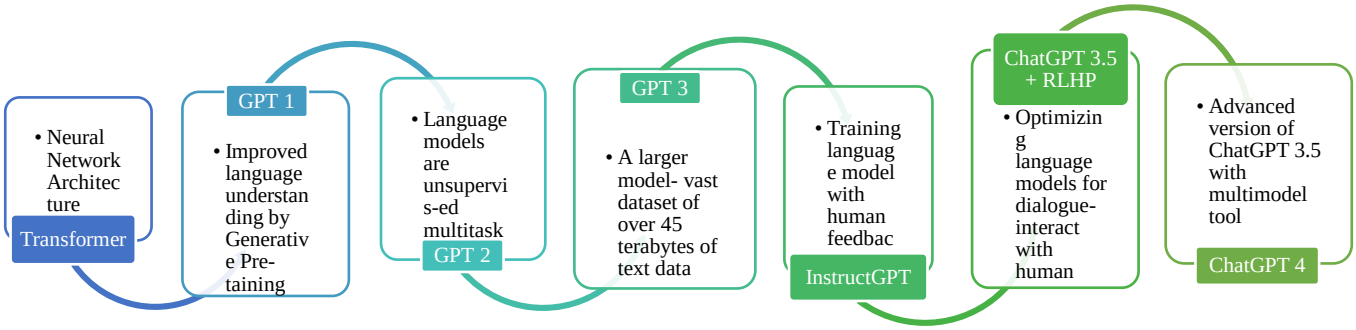

Figure 1. History of Evolution of ChatGPT

FEATURES OF CHATGPT

ChatGPT, the latest fruition of GPT exhibits astounding performance and has undergone tremendous improvement in the competitive examinations compared to its previous version (Choi et al., 2023). One further noteworthy observation is that ChatGPT-4's response time to multiple-choice questions is impressive (Choi et al., 2023). The other trending features of chat GPT 4 are:

- *Trustable responses*: It is a more sophisticated language model with more dependable and trustworthy responses. It makes use of deep learning technologies and natural language processing to generate more accurate results.
- *Scan handwritten text*: the advanced version of ChatGPT enables to scan the handwritten text as input. It is yet another quality of ChatGPT 4; that makes sending input easier than the previous version.
- *Multimodal tool*: this model generates the output based on multimodal inputs like images, videos and texts. An image scanner facility is available and an AI-based Chatbot can edit the image as per the comments of the users.
- *Generate interview questions*: ChatGPT 4 offers great assistance to those who wish to prepare an interview schedule daily; it facilitates to generate high standard interview questions. It provides more intelligent questions according to the needs of the user.
- *Input capabilities*: This version of ChatGPT is a perfect coding genius. It has massive amount of input that can be given at a time; around 25000 words can be provided as input in a single time which is eight times more than GPT 3. Even AI can generate pictures as per the instructions given by the user.
- *Deals with complex inputs*: ChatGPT 4 can understand the more complex input even the professional jargon can also decode and generate the output. It has virus and threat protection ability which is remarkable.
- *Improved deep learning*: It has more effective deep-learning technology, that ensures profound learning ability to update and attain deep knowledge. It improves writing ability and performs like a human being using an Artificial Neural Network.
- *Diversified range of language*: It recognizes other languages and generates answers in the prompted language, and it continues in the same language. ChatGPT 4 performs in a variety of languages and ensures language quality and accuracy which is compared to the previous version.
- *Response in a very short span*: It increases the ability to answer to the prompted questions in a shorter time frame. It improves the quality to generate quick and accurate answers in a few seconds.

CHATGPT IN EDUCATION

Nowadays there is a tendency to adopt newer and more useful technology in the teaching-learning process to improve the quality of education. In this sense, Artificial Intelligence (AI) emerges new technology with great potential in the field of education. The AI-based system facilitates personalized learning according to the needs and interests of the

learner. Several studies were carried out in the field of AI tools, especially the tool like ChatGPT regarding its application in the facet of education.

The studies revealed that ChatGPT offers great opportunities in the field of education even though there are some obstacles to overcome to attain the true essence of GPT in the teaching-learning process. Students get instant support in their learning and make learning self-directed anywhere and anytime. Consequently, it exhibits remarkable promises for enhancing learning effectiveness and offering tailored educational assistance to educators and learners alike. But it's important to consider the risks and constraints brought about by these technologies, including those on data protection, cultural differences, language competency, and related ethical considerations. (Wang et.al., 2023).

RESEARCH QUESTIONS

The following research questions are highlighted for the present study

1. What are the potentials of ChatGPT in the facet of teaching-learning?
2. What are the disadvantages of ChatGPT in the facet of teaching-learning?
3. What are the openings of ChatGPT in the facet of teaching-learning?
4. What are the risks of ChatGPT in the facet of teaching-learning?

METHODOLOGY

SWOT Analysis: For the present study, the researcher used SWOT analysis to get different perspectives on chatGPT in Education. The term SWOT, which stands for strengths, weaknesses, opportunities, and threats, was initially used as an outline to study organisational plans in the early 1950s (Benzaghta et al., 2021). According to Freddy Rangkuti (2013), a SWOT analysis identifies several elements systematically to create a business strategy. This analysis is predicated on reasoning that minimises dangers and weaknesses while maximising opportunities and strengths. In the field of education, SWOT analysis is one of the strategies widely used to analyse the different perspectives (internal and external) of a method or a technique. In instances where it is necessary to take into account the perspectives and capacities of several actors, this outline has been frequently utilized in the facet of teaching and learning process to guide deliberate planning and administration (Zhu & Justice Mugenyi, 2015). SWOT analysis is helpful to get data from different sources to analyse the factor both internally and externally. Here the researcher systematically reviewed the related studies to analyse the factor accurately.

Systematic Review: For that, the researcher has designed an organized review of related literature carried out in the field, particularly the studies that satisfy the research thoughts, such as potential of ChatGPT (strengths), disadvantages of ChatGPT(weaknesses), openings of ChatGPT (opportunities) and risks of ChatGPT (threats) in the facet of teaching-learning. As the initial step, the reviews were collected from reputed databases and journals like Scopus, Web of Science and other peer-reviewed journals. As the initial steps, research has located the studies limited to the period 2023. The located studies should highlight the answers towards the research questions of the present study. In the second step, the researcher collocated keywords like strengths of GPT, weaknesses of GPT, Opportunities of GPT and Threats of GPT, AI in Education etc. were integrated to pick out the exact literature that satisfy the objectives of the present study. Based on the preferred keywords, more than 60 pieces of literature were found. However, the book reviews, thematic articles, and other data from unauthentic sources were excluded from the review list. Again, the studies were filtered based on their authenticity of results in the field of education. Finally, the researcher found nearly 15 pieces of literature that are most authentic and specific to the objectives of the study.

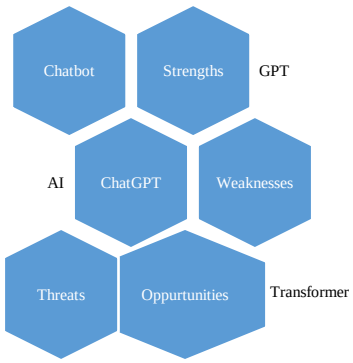

Figure 2. Keywords of the study

The criteria for the selection and rejection of the literature are given below.

- The related studies which were published in 2023 were included in the study.
- Full-text articles from reputed databases and peer-reviewed journals were reviewed.
- Research studies with qualitative, quantitative and mixed methods were considered.

- The studies were highly focused on strengths, weaknesses, opportunities and threats of GPT particularly in the field of education.

The detailed procedure of inclusion and the exclusion of the literature were noted in Figure 3.

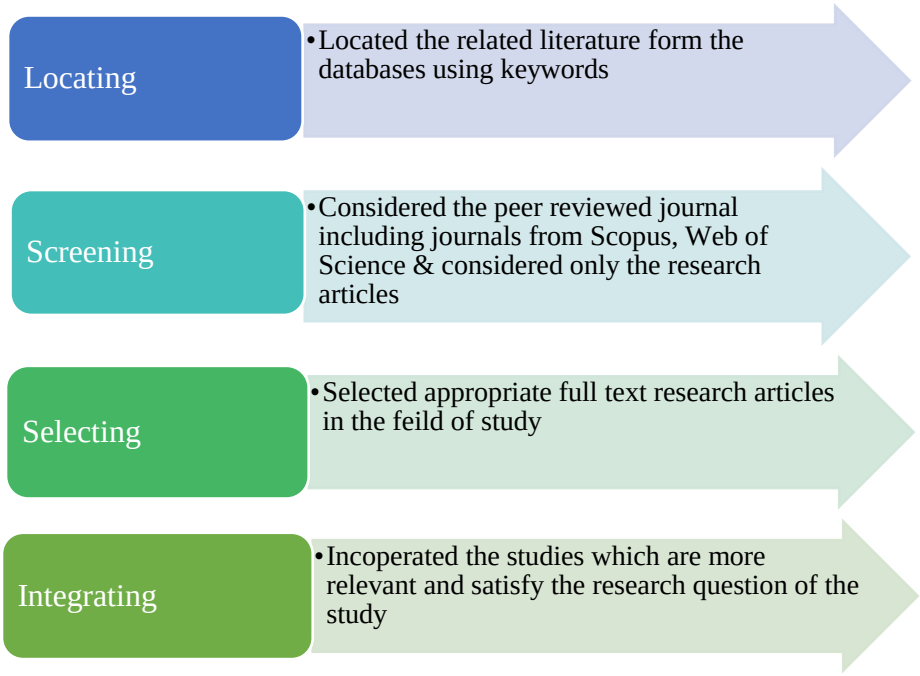

Figure 3. Method of the review process

FINDINGS OF THE STUDY

1. Strengths/Potentials of ChatGPT in Education

ChatGPT is more efficient at producing accurate and pertinent text when it has context understanding since it can grasp and react to complicated and nuanced inputs better (Mbakwe, 2013). Scalability or generating response quickly is another benefit of ChatGPT, as it enables it to manage several discussions at once and produce answers rapidly (Kuraku, et.al. 2023). This scalability makes it the perfect automated language translation because it boosts efficiency and decreases the need for human interaction. Because ChatGPT can manage numerous discussions at once, users may receive faster responses, which will increase their level of satisfaction (Kuraku, et.al. 2023). According to Khare & Dixit, 2023, ChatGPT provides several benefits, one among which is instant feedback. Efficiency is only one more benefit of ChatGPT. It can process a lot of data rapidly because of its quick response and capacity to manage several chats at once (Else, 2023). Self-improving capability: the researchers' degrees of difficulty and rigour regarding the use of in their analyses may differ. ChatGPT is a self-improving system that may advance in whatever subject it is frequently asked to work in (Lin et al., 2023). Another potential application of generative AI-based ChatGPT in education is the creation of interactive tutoring programmes that can respond to a student's questions and offer real-time guidance and evaluation. (Javaid et.al. 2023). This might entail giving students real-time feedback and help while they work, as well as leveraging AI to produce original tools or workouts (Tan, et.al., 2023, Hopkins, et.al., 2023 & Rathore, 2023).

2. Weaknesses/disadvantages of ChatGPT in Education

Sometimes ChatGPT's training data contains biases and false information, it may provide answers that are erroneous or biased. This problem is especially important in educational settings where imparting correct and trustworthy knowledge is the main objective. It is important to put policies in place to make sure that ChatGPT's material is accurate which helps to stop students from being misled (Xiao, 2023). There is a chance of a biased response because it was pre-trained by somebody else. Still, it is not entirely free of biases, continuous attempts to reduce predispositions in training data help ChatGPT to produce more objective and balanced results (Mijwil, et.al., 2023). One further constraint that was brought up has to do with the information being out of date. As ChatGPT does not automatically integrate real-time data, ChatGPT responded to queries asking for the most recent information by stating that the chatbot did not "have the facility to access existing events" because its "drill data only goes up until 2021" (Edwards, J. 2023). Another weakness of ChatGPT is that they are unable to ensure the information is authentic. Because chatGPT produces responses without any reference and it gives the information which is updated only till 2021.

3. Opportunities/openings of ChatGPT in Education

The availability of wide information on a single platform reduces the teaching workload. Chatbots can also assist teachers by answering routine queries, grading assignments, and providing additional resources to students (Khare & Dixit, 2023). It facilitates complex learning, students can work together on projects, communicate ideas, and share knowledge when educators use AI technology to facilitate cooperation and communication. By giving students individualised coaching, ChatGPT has the possibility to transform science education through personalised learning experiences. ChatGPT to modify its descriptions and approach to problem-solving to maximise knowledge and retention. According to Mbakwe et al. (2023), this individualised method of instruction can close educational gaps and give students the tools they need to succeed in their scientific endeavours. By examining data on students' learning preferences, abilities, and shortcomings, ChatGPT can be utilised to offer individualised learning experiences. ChatGPT can assist students in enhancing their academic performance and engagement by offering personalised recommendations for learning resources and activities (Baidoo-Anu & Ansah, 2023). By customising its responses according to user choices, interests, and conversational styles, ChatGPT can be improved to offer more individualised experiences for users (Huang et al., 2023). Students can have individualised learning experiences while using ChatGPT. GPT can provide students with individualised learning resources, including articles, videos, and textbooks, based on an analysis of their learning styles and preferences (Božić & Poola, 2023).

4. Threats/risks of ChatGPT in Education

There is a chance of plagiarism while using ChatGPT which will affect the academic writing of both teachers and students. Concerns regarding data security and privacy are growing in frequency as AI is used more and more in data processing and analysis. It is crucial to make sure that sensitive data is protected and that it is used ethically. Because it may be used to identify and stop cyberattacks, ChatGPT has had a significant impact on the field of cyber security (Altaf, 2023). Chatbots are unable to comprehend human feelings and experiences. It is unable to sympathise with users in the same manner that a human would, despite its ability to mimic human language and offer appropriate and helpful responses (Borji, 2023). This is because human beings have subjective feelings and experiences influencing their ideas and behaviour, whereas chatbots are programmed to function using algorithms and data. The excessive usage of chatGPT will affect the cognitive ability of the students. Students become lay to think critically and creatively.

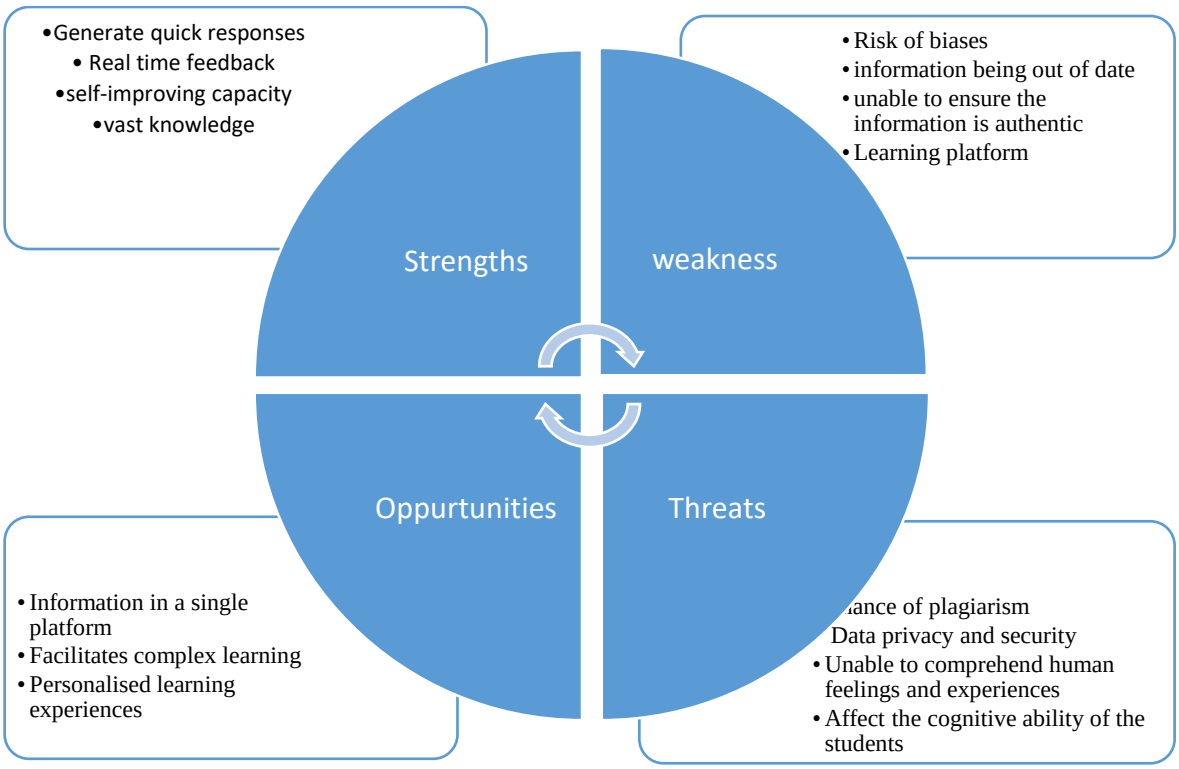

Figure 4. SWOT analysis of ChatGPT in Education

SUGGESTIONS AND RECOMMENDATIONS

Give students assignments that go beyond the basics and encourage critical thinking and active engagement; let them know about ChatGPT's limitations and the possible consequences of relying solely on it; emphasise the value of academic integrity and ethical behaviour; and clearly outline expectations and guidelines for students in the syllabus. Utilise this technology to enhance their learning and abilities, but do not replace original thought and writing with it. Be

cognizant of the appropriate and moral application of ChatGPT in their classes and the ramifications of depending entirely on it for academic integrity.

It is recommended that educational institutions familiarise themselves with the potential applications of large language models and establish open lines of communication to engage in transparent discussions with researchers and IT support, among other relevant stakeholders. Additionally, they should establish and enforce explicit policies and guidelines regarding the use of AI tools, like ChatGPT, and provide faculty, staff, and students with resources and training on academic integrity and responsible use of AI tools in education.

REFERENCES

[1] Altaf, Y. (2023, March 7). 5 Ways ChatGPT Will Impact Digital Marketing. Entrepreneur. https://www.entrepreneur.com/growing-a-business/5- ways-chatgpt-will-impact-digital-marketing/446208
[2] Baidoo-Anu, D., & Ansah, L. O. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Journal of AI*, *7*(1), 52-62.
[3] Banihashem, S. K., Noroozi, O., van Ginkel, S., Macfadyen, L. P., & Biemans, H. J. A. (2022). A systematic review of the role of learning analytics in enhancing feedback practices in higher education. *Educational Research Review*, 37, 100489. https://doi.org/10.1016/j.edurev.2022.100489
[4] Borji, A. (2023) "A Categorical Archive of ChatGPT Failures." arXiv, 03. doi: 10.48550/arXiv.2302.03494.
[5] Božić, V & Poola, I. (2023). Chat GPT and education. DOI:10.13140/RG.2.2.18837.40168
[6] Edwards, J., Flavián, G., Gauld, R., Grover,V., Hu, M., Janssen, M., Jones,P., Junglas, I., & Khorana, S. (2023). So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management, 71*.
[7] Else, H. (2023). Abstracts written by ChatGPT fool scientists. Nature. https://doi.org/10.1038/d41586-023-00056-7
[8] Hopkins, A, M., Logan, J. M., Kichenadasse, G., & Sorich,M J (2023).Artificial intelligence chatbots will revolutionise how cancer patients access information: ChatGPT represents a paradigm shift, JNCI Cancer Spectr. 7 (2).
[9] Huang, F., Kwak, H., & An, J. (2023). Is chatgpt better than human annotators? potential and limitations of chatgpt in explaining implicit hate speech. *arXiv preprint arXiv:2302.07736*.
[10] Javaid, M., Haleem, A., Singh, R. P., Khan,S & Khan, I H. (2023).Unlocking the opportunities through ChatGPT Tool towards ameliorating the education system, *BenchCouncil Transactions on Benchmarks, Standards and Evaluations*, *3*(2).
[11] Kuraku, S., Samaah, F., Kalla, D. & Smith, N. (2023). Study and Analysis of Chat GPT and its Impact on Different Fields of Study. https://www.researchgate.net/publication/369539233
[12] Lin, C. C., Huang, A. Y., & Yang, S. J. (2023). A review of AI-driven conversational chatbots implementation methodologies and challenges (1999–2022). *Sustainability*, *15*(5), 4012.
[13] Maaz, M., Rasheed, H., Khan, S., & Khan, F. S. (2023). Video-ChatGPT: Towards Detailed Video Understanding via Large Vision and Language Models. arXiv preprint arXiv:2306.05424.
[14] Mbakwe AB, Lourentzou I, Celi LA, Mechanic OJ, Dagan A (2023) ChatGPT passing USMLE shines a spotlight on the flaws of medical education. PLOS Digit Health 2(2): e0000205. https://doi.org/10.1371/journal.pdig.0000205
[15] Mijwil, M., Mohammad Aljanabi, & Ahmed Hussein Ali. (2023). ChatGPT: Exploring theRole of Cybersecurity in the Protection of Medical Information . *Mesopotamian Journal of CyberSecurity*, *2023*, 18–21. https://doi.org/10.58496/MJCS/2023/004
[16] Rangkuti, F. (2013). Analisis SWOT Teknik Membedah Kasus Bisnis. (Jakarta: PT. Gramedia Pustaka Utama.
[17] Rathore, B. (2023) Future of textile: Sustainable manufacturing & prediction via ChatGPT, Eduzone: Int. Peer Rev./Refer. Multidiscip. J. 12 (1), 52–62
[18] Tan, Y., Min, D., Li, Y., Li, W., Hu, N., & Chen, G. (2023) Qi, Evaluation of ChatGPT as a question answering system for answering complex questions, arXiv preprint arXiv:2303.07992.
[19] Xiao, Z. (2023). Educational response in the era of ChatGPT: Prohibition or change. Geographical *Research Bulletin*, 2, 116-119.
[20] Zhu, C., & Justice Mugenyi, K. (2015). A SWOT analysis of the integration of e-learning at a university in Uganda and a university in Tanzania. *Technology, Pedagogy and Education*, 24(5), 1–19. https://doi.org/10.1080/1475939X.2015.1093537

BIOGRAPHY

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