



ChatGPT in Research and Higher Education: Media Discourse Analysis of Ethical Challenges and Implications

Aayesha Sagir Khan

College of Languages and Translation, King Khalid University, Abha Kingdom of Saudi Arabia

Abstract

Purpose: The main purpose of the study has remained to conduct a media discourse analysis of ChatGPT usage in higher educational fields and the research studies conducted in the research fields.

Methodology: The methodical approach of the study has focused on analysing the Media discourse through the development of the critical evaluation of different features present within the ChatGPT. Primary quantitative data analysis is developed using survey results from the 91 participants, bearing the roles of academicians and researchers working together. For conducting the secondary quantitative analysis, the graphs developed through the existing Statista-based data are evaluated depending on different themes related to the trends of ChatGPT usage among academic field associates and scholars.

Results: Most of the respondents disagreed with ChatGPT's ethics maintenance capacity. The dependent variable-based t value is 17.208, which shows a high mean difference from the predicted value and provides the statistical significance of the hypothesis.

Keywords: ChatGPT, Academic sensitivity, Research, Pedagogical implications, Academic dishonesty

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Introduction

ChatGPT is an interface-based chatbot developed through the application of Artificial Intelligence is one of the most used AI tools at present. High-quality answer-generating ability has led to the development of widespread usage of the tool in all aspects of society. However, the emergence of chatGPT has created high-end issues regarding security risks and ethical implications.

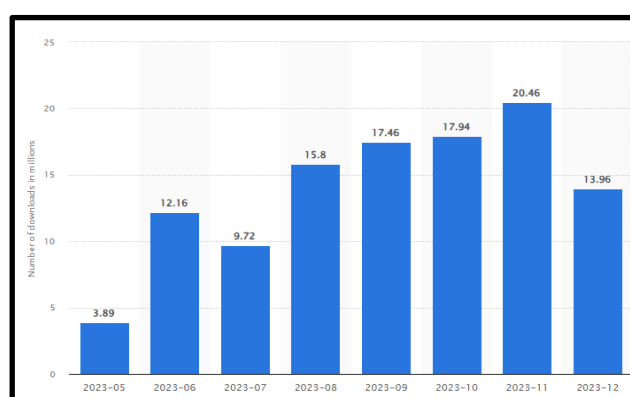


Figure 1: Worldwide ChatGPT download in 2023 second half in Million

(Source: Bianchi, 2024)

The above graph is an expression of worldwide ChatGPT downloads for different purposes during the last financial year in millions. During May 2023, the number of downloads in ChatGPT was 3.89 million at an approx. That witnessed growth during the last half of the year and achieved 13.96 million in December, with a surge to 20.46 Million in November 2023 (Bianchi, 2024). AI has promoted a "knowledge-based

economy” to instigate the development of human beings within their higher education. Research has bestowed the improved structure of the “infrastructures of higher education” and “think-tank research” delivering various projects in diverse professional fields (Nam and Bai, 2023). The recent generation of the “chat generative pre-trained transformer” has regulated the “knowledge ecology system” in various institutions including healthcare management, educational institutions, and business organisations.

Aim: The study aims to develop a concept about the ChatGPT and its ethical implications for the maintenance of inclusiveness of research works and higher education.

Objectives:

- To conduct a Media Discourse Analysis of different aspects of ChatGPT-generated content to define the authenticity and inclusiveness of the features
- To create an idea about the challenges the researchers and academicians face while developing research studies using ChatGPT
- To evaluate the trends of thoughts among higher education pursuers and scholars about the authenticity of ChatGPT-developed contents
- To investigate the differences and disruption in educational and research ethics with the surge of ChatGPT

Hypotheses:

H0: ChatGPT usage does not disrupt the significance of educational ethics in higher educational fields.

H1: Structure, Language, framing and Sensitivity of the ChatGPT contents play an important role in disrupting the ethics maintenance while using the information in study contents.

Background of study

Artificial Intelligence coined by John McCarthy in 1955 refers to making a machine behave in ways that would be described as intelligent if a human was so behaving (McCarthy et al., 1955). AI is also defined as a branch of computer science focused on exploring the fundamental nature of intelligence through algorithmic processes that develop intelligent systems resembling human cognition (Dwivedi, 2021)

KhosraviNik (2010) underscores the importance of media discourse analysis in revealing bias and manipulation, particularly in digital media contexts where algorithms curate content to align with ideological agendas. Moreover, Baker et al. (2008) advocate for corpus-based approaches to media discourse analysis, enabling researchers to uncover patterns and trends across large datasets. These studies collectively demonstrate that media discourse analysis is an invaluable tool for understanding the dynamic relationship between language, media, and society. The work is significant for researchers looking to explore the intersection of language, power, and society in large datasets, making it an essential resource in the field of media discourse analysis.

AI technologies have been integrated into teaching and learning since the 1970s, and today, these technologies are utilized in diverse educational settings. This includes personalized learning and assessment applications, as well as information systems designed to manage administrative and organizational tasks in schools (Al Braiki et al., 2020 and UNESCO, 2021a). According to (UNESCO, 2021a) AI in education is expected to be worth \$6 billion by 2024. The rapid development of Artificial Intelligence (AI) is having a major impact on education. Advances in AI-powered solutions carry enormous potential for social good and the achievement of the Sustainable Development Goals.

Introduced by OpenAI (San Francisco, CA) in November 2022, ChatGPT is described as “a powerful machine learning software that employs the Generative Pre-trained Transformer (GPT) algorithm to produce human-like responses to text-based inputs.” It was trained on an extensive dataset comprising articles, websites, books, and written dialogues. Additionally, through fine-tuning processes such as dialogue optimization, ChatGPT can engage with prompts in a conversational style (Health, 2023). ChatGPT’s proficiency in understanding natural language queries and producing human-like responses has made it a

widely used tool for obtaining quick answers on a range of topics, from simple to complex. Its expanded model size enhances its natural language processing capabilities, enabling more sophisticated reasoning and comprehension across multiple domains. This adaptability allows ChatGPT to tackle challenging tasks, such as providing detailed descriptions of submitted images or responding to handwritten queries presented as graphics (OpenAI, 2023).

For students, the integration of AI has been shown to enhance motivation and engagement (Xia et al., 2022). It fosters increased interest in learning (Lin & Chang, 2020) and supports interactive learning environments through tools, which encourage active engagement with educational content (Karsenti, 2019). Numerous studies highlight significant improvements in academic performance facilitated by AI technologies (Khan et al., 2021; Kim et al., 2021). AI also positively impacts learning outcomes and student satisfaction (Winkler & Söllner, 2018), optimizing their learning capabilities and overall achievement (Clarizia et al., 2018).

Methodology

The study has focused on using the Media Discourse Analysis process in evaluating the impacts of the ChatGPT regarding ethics maintenance. Structural elements of the contents are chosen as the answer framing style used by the ChatGPT console and their authenticity is based on indexed journal formats. Another significant characteristic of ChatGPT content that is selected under the contextual category includes sensitivity (Li *et al.* 2024). Intending to analyse these features, the researcher has remained focused on conducting a primary quantitative analysis of the collected data. Based on these four aspects, four independent variables are chosen including “Languages used in ChatGPT generated contents”, “Framing of contents in ChatGPT”, “Representation style of ChatGPT” and “Sensitivity of ChatGPT generated contents”. A questionnaire set consisting of 16 close-ended questions is developed with 3 demographic and 13 close-ended Likert scale-based questions. Using the simple random sampling method, 91 participants from different universities, teachers and students are chosen as the research respondents. Using the IBM SPSS application, different statistical tests are conducted regarding the responses. The researcher has focused on developing an idea about the existing statistics regarding different media features of the ChatGPT.

Results

Primary Quantitative

Frequency Analysis

Frequency Analysis is done in the primary quantitative data analysis to find the demographic tendencies present within different participants within the survey process. Here, the male members present among the total 91 participants is almost 51.6% and female members are present at 48.4%. On the other hand, 13.2% of the total participants are found to be students. However, a higher tendency to use ChatGPT is found among academicians and researchers with a percentage of 46.2%. Similarly, the total number of professors that use ChatGPT for academic purposes is 37, with a percentage of 40.7%. Against this question, 12.9% of participants have opined that they bear a tendency of using ChatGPT for studying. Almost 58.2% of the participants have opined that they do use ChatGPT because the fast processing of Data occurring within the ChatGPT console provides them with a higher chance of using the software in conducting significant tests. Moreover, 29.7% of the participants are using ChatGPT for the benefits of the accuracy induced within the systemic structure development.

Descriptive Statistics

Based on the answers developed from the different researchers and academicians that are participants of this particular study, the highest mean value is seen from the question “ChatGPT generated contents are framed properly, maintaining the structuring framework of different indexed researcher journals” with a value of 2.37.

	Mean	Std. Deviation
Languages used in the ChatGPT-generated content are appropriate for Research Papers and articles.	1.96	1.084
Ethical usage of formulas and ideas in ChatGPT-generated content enhances the credibility of using them in articles and papers.	2.29	1.537
Words and structures used in the ChatGPT developed contents are approved to be used in properly organised and developed research contents.	1.97	1.130
ChatGPT-generated contents are framed properly, maintaining the structuring framework of different indexed STEM journals.	2.37	1.473
Providing proper information through maintaining research ethics remains the main objective of ChatGPT, rather than speedy replying.	2.04	1.201
No unethical bias is present in the ChatGPT development educational content that provides ChatGPT a high range of authenticity.	2.30	1.434
ChatGPT-generated educational components are mostly user-centric and bear an instructive influence on the perception of users.	2.02	1.202
ChatGPT responses encourage critical thoughts and reassure users of certainty depending on the influences of ethical content production.	2.35	1.385
Privacy-related dilemmas and uninformed usage of article-oriented content are developed in ChatGPT, enhancing vulnerabilities of research ethics.	2.19	1.228
Navigation of ChatGPT-generated educational content follows a specific norm that is not always followed in every part of the global educational world.	2.33	1.350
Generalised applicability is a negative trait of the ChatGPT generated contents that violate the chances for the researchers to use data in specific research contents.	2.14	1.296
While maintaining the regional nuances, the general applicability of the ChatGPT-developed contents creates ethical violations in the case of secondary studies.	2.33	1.291
Maintaining the accuracy and integrity of the sourced information and developing autonomy in studies are the most important ethical aspects of STEM research work and higher education.	2.35	1.303

Table 1: Descriptive Statistics

The standard deviation is found against the same question as 1.473, indicating a high range of deviation of the participants from their mean opinion to other sets of opinions. On the other hand, the lowest mean value is found against the question “Languages used in the ChatGPT generated contents are appropriate to use in Research Papers and articles” indicating a value of 1.96 that typically provides an opinion that most of the participants do not think that the ChatGPT languages and the terms used, despite being utterly professional, are usable in an academic research article.

Correlation

Among the three factors present within the range of the first independent variable, the highest Pearson Correlation value is found against the question “Languages used in the ChatGPT generated contents are appropriate to use in Research Papers and articles” with a value of 0.798. The value being positive, shows that the Research Papers and Articles are positively impacted by the usage of ChatGPT-oriented lingual terms, indicating the fall of inclusiveness of the papers.

	Maintaining the accuracy and integrity of the sourced information along with the development of autonomy in studies are the most important ethical aspects of STEM research work and higher education.				
	Ethical usage of Words and formulas structures and ideas used in the ChatGPT- developed contents are approved for use in properly organised and developed research content.				
Maintaining the accuracy and integrity of the sourced information and developing autonomy in studies are the most important ethical aspects of STEM research work and higher education.	Pearson Correlation	1	.798**	.793**	.748**
Languages used in the ChatGPT-generated content are appropriate for Research Papers and articles.	Pearson Correlation	.798**	1	.908**	.888**
Ethical usage of formulas and ideas in ChatGPT-generated content enhances the credibility of using them in articles and papers.	Pearson Correlation	.793**	.908**	1	.888**
Words and structures used in the ChatGPT- developed contents are approved for use in properly organised and developed research content.	Pearson Correlation	.748**	.888**	.888**	1

Table 2: Correlation between DV and IV 1

On the other hand, different results are generated from the Partial Correlation Analysis conducted against the Dependent Variable and the second Independent Variable. In both cases the value of dependency is found as 0.788, indicating a positive relationship between the “educational ethics” and the framing style of the ChatGPT developed contents, along with their implications upon the unbiased behavior of ChatGPT.

Maintaining the accuracy and integrity of the sourced information along with the development of autonomy in studies are the most important ethical aspects of STEM research works and the higher educational process.	Pearson	1	.788**	.778**	.788**
ChatGPT-generated contents are framed properly, maintaining the structuring framework of different indexed STEM journals.	Pearson	.788**	1	.914**	.931**
Providing proper information through maintaining research ethics remains the main objective of ChatGPT, rather than speedy replying.	Pearson	.778**	.914**	1	.863**
No unethical bias is present in the ChatGPT development educational content that provides ChatGPT a high range of authenticity.	Pearson	.788**	.931**	.863**	1

Table 3: Correlation between DV and IV 2

All these values being significantly higher than 0.700 provide an idea that the ChatGPT-related features are strongly impacting the authenticity and ethical practice of research and higher educational research studies. The third independent variable and the dependent variable-based correlation analysis shows that the highest Pearson Correlation value over all the variables is found against this test, with a value of 0.861. Such a high value of the Pearson Correlation Index is found against the question "Privacy-related dilemma and uninformed usage of article-oriented contents are developed in ChatGPT, enhancing vulnerabilities of research ethics".

Maintaining the accuracy and integrity of the sourced information along with the development of autonomy in studies are the most important ethical aspects of STEM research work and higher education.	Pearson Correlation	1	.769**	.749**	.861**
ChatGPT-generated educational components are mostly user-centric and bear an instructive influence on the perception of users.	Pearson Correlation	.769**	1	.836**	.848**
ChatGPT responses encourage critical thoughts and reassure users of certainty depending on the influences of ethical content production.	Pearson Correlation	.749**	.836**	1	.855**
Privacy-related dilemmas and uninformed usage of article-oriented content are developed in ChatGPT, enhancing vulnerabilities of research ethics.	Pearson Correlation	.861**	.848**	.855**	1

Table 4: Correlation between DV and IV 3

All these values being higher than 0.7 typically show that ChatGPT usage for educational purposes without thinking about the ethical complications requires an ethical production of different contents that can resolve the issues with the study's ethical integrity.

Maintaining the accuracy and integrity of the sourced information along with the development of autonomy in studies are the most important ethical aspects of STEM research works and the higher educational process.	Pearson Correlation	1	.769**	.749**	.861**
ChatGPT-generated educational components are mostly user-centric and bear an instructive influence on the perception of users.	Pearson Correlation	.769**	1	.836**	.848**
ChatGPT responses encourage critical thoughts and reassure users of certainty depending on the influences of ethical content production.	Pearson Correlation	.749**	.836**	1	.855**
Privacy-related dilemmas and uninformed usage of article-oriented content are developed in ChatGPT, enhancing vulnerabilities of research ethics.	Pearson Correlation	.861**	.848**	.855**	1

Table 4: Correlation between DV and IV 4

On the other hand, the least value against this specific correlation analysis is found as 0.792 against the question "Navigation of ChatGPT generated educational contents follows a specific norm that is not always followed in every part of the global educational world" that creatively provides an idea about the ChatGPT getting a higher position in the choices of the global researchers and academicians day by day.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.941 ^a	.886	.869	.472

Table 5: Model Summary

The R-value generated from this regression analysis within this specific study is found to be 0.941. Moreover, the R square value generated in this test being 0.886 critically indicates that in almost 88.6% of cases, the predicted value and the observed values of the correlation have matched.

ANOVA

Here, the Regression Sum of Squares value is found as 135.389 indicating that the researcher had predicted that there would be a strong difference in the opinions of the respondents against different questions.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	135.389	12	11.282	50.698	.000 ^b
	Residual	17.358	78	.223		
	Total	152.747	90			

Table 6: ANOVA

On the other hand, the Residual Value of the Sum of Squares is found as 17.358 that has a high and strong difference from the regression value. Based on these two values, the critical indication is that the opinions of the respondents have remained almost similar to one another.

One sample t-Test

Based on the One Sample t-Test, the t value is found against the dependent variable related question “Maintaining accuracy and integrity of the sourced information along with development of autonomy in studies are the most important ethical aspects of research works and higher educational process” with a value of 17.220.

	Sig. (2-Mean tailed)	Difference
Maintaining the accuracy and integrity of the sourced information along with the development of autonomy in studies are the most important ethical aspects of STEM research works and the higher educational process.	.000	2.352
Languages used in the ChatGPT-generated content are appropriate for Research Papers and articles.	.000	1.956
Ethical usage of formulas and ideas in ChatGPT-generated content enhances the credibility of using them in articles and papers.	.000	2.286
Words and structures used in the ChatGPT developed contents are approved to be used in properly organised and developed research contents.	.000	1.967
ChatGPT-generated contents are framed properly, maintaining the structuring framework of different indexed STEM journals.	.000	2.374
Providing proper information through maintaining research ethics remains the main objective of ChatGPT, rather than speedy replying.	.000	2.044

No unethical bias is present in the ChatGPT development educational content that.000 provides ChatGPT a high range of authenticity.	2.297
ChatGPT-generated educational components are mostly user-centric and bear an.000 instructive influence on the perception of users.	2.022
ChatGPT responses encourage critical thoughts and reassure users of certainty.000 depending on the influences of ethical content production.	2.352
Privacy-related dilemmas and uninformed usage of article-oriented content are.000 developed in ChatGPT, enhancing vulnerabilities of research ethics.	2.187
Navigation of ChatGPT-generated educational content follows a specific norm that is.000 not always followed in every part of the global educational world.	2.330
Generalised applicability is a negative trait of the ChatGPT generated contents that.000 violate the chances for the researchers to use data in specific research contents.	2.143
While maintaining the regional nuances, the general applicability of the ChatGPT-.000 developed contents creates ethical violations in the case of secondary studies.	2.330

Table 7: T-test

Among different factors related to the first independent variable, the highest t value is found against “Languages used in the ChatGPT generated contents are appropriate to use in Research Papers and articles” with a value of 17.208. The highest t value against different factors of the third independent variable is found against “Privacy related dilemma and uninformed usage of article-oriented contents are developed in ChatGPT, enhancing vulnerabilities of research ethics” with a value of 16.981. Moreover, the fourth independent variable shows the highest t value against its factor “While maintaining the regional nuances, the general applicability of the ChatGPT developed contents create ethical violation in case of secondary studies” with a value 17.208.

Secondary Quantitative

Theme 1: Demographic usage of ChatGPT among educational users worldwide

Mostly, the higher educational fields are found to be using ChatGPT as a solution for generating AI-based assistance in their studies. From the above graph, the demographic groups starting from the age of 25 and ending at the age of 34, bearing the maximum number of researchers, scholars, and higher education students worldwide, and their usage of ChatGPT are found. The graph shows that the lower-aged students, bearing an age below 24 years, are found to be the ones bearing a significantly high tendency to use ChatGPT for their education. The percentage they hold is nearly 35% of the total number of users.

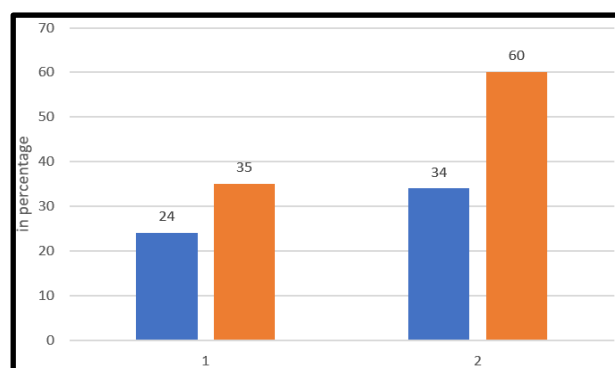


Figure 2: Age Wise usage of ChatGPT

(Source: MS Excel)

On the other hand, the number of users bearing an age group of more than 34 years, has a percentage of 60% approx that have downloaded ChatGPT for their educational purpose. However, the highest percentage is found in the demographic group of male researchers upon the female ones, showing a percentage of 65% and the female ones bearing 35% (Thormundsson, 2024). The tendencies of the below 24 aged academic students is natural because they are generally more familiar with the usage of Chatbots.

Theme 2: ChatGPT and other Chatbots downloading Keyword usage

ChatGPT and any other chatbots are an actual model of “Generative-based Pre-trained Transformer” that was invented in the year 2022. People, being unaware of the authentic concept of the ChatGPT console, and the differences the console holds with other chatbots, keep using different keywords while downloading the software, and similar software options available in the digital marketplace.

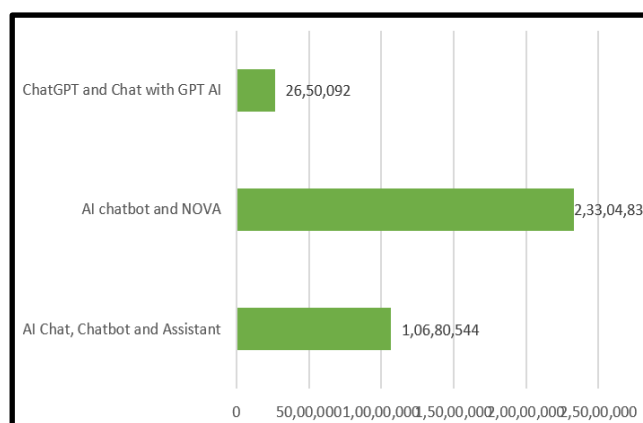


Figure 3: Numbers of Downloads, using the keywords “Chatbot” and “ChatGPT”

(Source: MS Excel)

From the above graph, the usage of “AI chat”, “Chatbot” and “Assistant” are found to be the least used keywords indicating a total download of 10,680,544 hits in the online application stores, including both Apple Store and Google Play store. On the other hand, the highest used Keywords that are found as “AI chatbot” and “Nova” have shown hits of 23,304,835 total (Bianchi, 2024). The Chat-AI and Ask Anything hit the number of 2,650,092, showing statistical significance.

Theme 3: ChatGPT traffic among worldwide academicians

This era is indicating the software towards a significant growth of Generative AI solutions approach development within the periphery of education. Among these downloading trends, and the usage of the same for educational purposes, almost 20% is seen among the academics belonging to the United States of America, the home country of Open AI, the mother company of ChatGPT. On the other hand, the ChatGPT is being used widely in countries like Germany, France, Brazil and the United Kingdom.

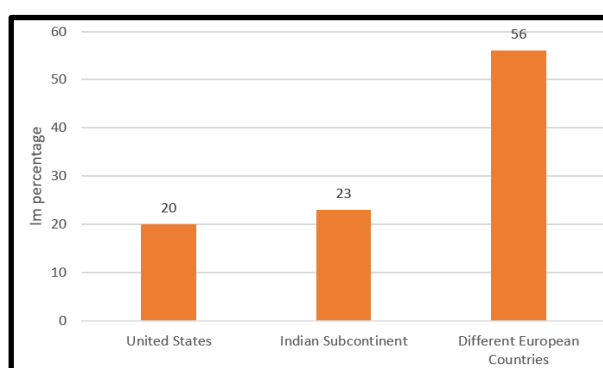


Figure 4: Worldwide traffic of ChatGPT

(Source: MS Excel)

Almost 23% of the ChatGPT traffic is generated from the different subcontinental regions. However, the total global traffic has witnessed a sudden loss in the total traffic that includes a percentage of almost 30% (Bianchi, 2024). Other countries have provided an outcome about the traffic related to ChatGPT in 57%, with 49.5% of the surge being generated from the source country, the United States of America.

Discussion

The aforementioned answers look like they have significant authenticity in their semantic and grammatical structure but they include misinformation, referred to as the “Hallucination” disruption of ChatGPT (Hua *et al.* 2024). Suggestions generated through ChatGPT develop important engagement of the researchers that violate the informed consent development of the researchers and create a potential substitution through pedagogical implications (Baskara, 2023). Using such information through ChatGPT identifies the ethical violation of the most important study ethics, namely “Confidentiality”.

One AI tool can replicate significant outsourced effective information with typically wrong misinformation sets bearing the apparent look of spreading authentic information. Academic dishonesty is one important concern that is easily understandable in the case of using ChatGPT as an effective writing tool in the case of educational studies (Zeb *et al.* 2024). Potential risks are enhanced with the enhancement of usage of these tools due to the disruption of Academic sensitivity (Huallpa, 2023). The business occurs due to the implications of the designers upon the reliance on the holistic process of ChatGPT-based content creation.

Conclusion

A complex and multifaceted ethical dilemma can be found in AI systems like ChatGPT. Development of Artificial intelligence is never-ending and this growth acts as a crucial factor in the development of guidelines and practicing accuracy increment. The models present within the collaborative functionality of ChatGPT provide an exploratory chance to ensure responsibility and develop beneficial usage for the same. Innovation in platforms like GPT requires a specific ethical consideration to assure AI-based benefit development for the social minimisation of the risks. Large Scale Learning system involvement creates a higher Carbon footprint that involves training and operating the systems. The necessary minimisation of sustainable development for enabling the training system of these AI-based large-scale learning models creates vulnerability in the inclusiveness. Moreover, Cybersecurity issues are prevalent, indicating a requirement for policy development by the administrators in boundary creation for the usage of these AI tools.

Analysing the media discourse of the usage of ChatGPT in educational programmes develops an idea about the recurring themes identification, narrative development and framing the positive and negative postulates. The stakeholders of ChatGPT usage including the undergraduate, postgraduate and Doctoral students including the freelance researchers are impacted by the typical integrity of key narratives of ChatGPT. One most significant drawbacks of ChatGPT remains on enabling the students to conduct cheating activities through the instant generation of essays, code snippets and other problems. Moreover, the academic honesty and integrity get disrupted due to the plagiarism occurrence. Academic research procedure needs proper concurrent occurrence of all the typical steps including literary reviews and primary and secondary data collection depending on the generated results.

There are several advantages to using AI in education, as well as certain difficulties. AI may improve learning outcomes, productivity, and student engagement by opening up new avenues for individualized education, feedback, and assistance. Sometimes ChatGPT acts as a misleading result developing software that creates hidden biased answers based on the own calculative power rather than evaluating the true factors. Blindly following ChatGPT can be easily vulnerable to improper literary reviews and hypotheses generation in the wrong way. Moreover, the critical thinking ability of the researchers can gradually decrease due to over-reliance on ChatGPT.

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Reference List

1. Al Braiki, B., Harous, S., Zaki, N., & Alnajjar, F. (2020). Artificial intelligence in education and assessment methods. *Bulleting of Electrical Engineering and Informatics*, 9(5), 1998–2007. <https://doi.org/10.11591/eei.v9i5.1984>
2. Baker, P., Gabrielatos, C., & McEnery, T. (2008). Using corpora in discourse analysis. *Continuum*.
3. Baskara, R., 2023. Exploring the implications of ChatGPT for language learning in higher education. *Indonesian Journal of English Language Teaching and Applied Linguistics*, 7(2), pp.343-358.
4. Bianchi. T. 2024., *Distribution of OpenAI.com worldwide traffic from January 2023 to January 2024, by region*. [Online] Available at: <https://www.statista.com/statistics/1386581/openai-com-traffic-distribution-region>
5. Bianchi. T. 2024., *Downloads of mobile apps using the keywords "chatbot" and "ChatGPT" in their title or description worldwide between January and October 2023*. [Online] Available at: <https://proxy.parisjc.edu:8293/statistics/1357710/chatbot-chatgpt-keyword-app-downloads/>
6. Bianchi. T. 2024., *Number of ChatGPT monthly app downloads worldwide from May 2023 to December 2023*. [Online] Available at: <https://www.statista.com/statistics/1386342/chat-gpt-app-downloads/>
7. Clarizia, F., Colace, F., Lombardi, M., Pascale, F., & Santaniello, D. (2018). Chatbot: An education support system for student. *International symposium on cyberspace safety and security*. Springer. https://doi.org/10.1007/978-3-030-01689-0_23
8. Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A., Galanos, V., Ilavarasan, P. V., Janssen, M., Jones, P., Kar, A.K., Kizgin, H., Kronemann, B., Lal, B., Lucini, B., ... Williams, M. D. (2021). Artificial intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 57, 101994. <https://doi.org/10.1016/j.ijinfomgt.2019.08.002>
9. Health, T. L. D. (2023). ChatGPT: Friend or foe? *The Lancet: Digital health*, 5(3), e102. [https://doi.org/10.1016/S2589-7500\(23\)00023-7](https://doi.org/10.1016/S2589-7500(23)00023-7)
10. Hua, S., Jin, S. and Jiang, S., 2024. The limitations and ethical considerations of ChatGPT. *Data intelligence*, 6(1), pp.201-239.
11. Huallpa, J.J., 2023. Exploring the ethical considerations of using Chat GPT in university education. *Periodicals of Engineering and Natural Sciences (PEN)*, 11(4), pp.105-115.
12. McCarthy, J., Minsky, M. L., Rochester, N., & Shannon, C. E. (1955). A proposal for the Dartmouth summer research project on artificial intelligence. *AI Magazine*, 27(4), 12-14.
13. Karsenti, T. (2019). Artificial intelligence in education: The urgent need to prepare teachers for tomorrow's schools. *Formation et Profession*, 27(1), 112-116. <https://doi.org/10.18162/fp.2019.a166>
14. Khan, I., Ahmad, A. R., Jabeur, N., & Mahdi, M. N. (2021). An artificial intelligence approach to monitor student performance and devise preventive measures. *Smart Learning Environments*, 8(1), 1-18. <https://doi.org/10.1186/s40561-021-00161-y>
15. Kim, H. S., Kim, N. Y., & Cha, Y. (2021). Is it beneficial to use AI chatbots to improve learners' speaking performance? *Journal of ASIA TEFL*, 18(1), 161-178. <https://doi.org/10.18823/asiatefl.2021.18.1.10.161>
16. KhosraviNik, M. (2010). The representation of refugees, asylum seekers, and immigrants in British newspapers: A critical discourse analysis. *Journal of Language and Politics*, 9(1), 1-28.

17. Li, L., Ma, Z., Fan, L., Lee, S., Yu, H. and Hemphill, L., 2024. ChatGPT in education: A discourse analysis of worries and concerns on social media. *Education and Information Technologies*, 29(9), pp.10729-10762.
18. Lin, M. P.-C., & Chang, D. (2020). Enhancing post-secondary writers' writing skills with a chatbot. *Journal of Educational Technology & Society*, 23(1), 78-92.
19. Nam, B.H. and Bai, Q., 2023. ChatGPT and its ethical implications for STEM research and higher education: a media discourse analysis. *International Journal of STEM Education*, 10(1), p.66.
20. OpenAI. (2023, March). GPT-4 Developer Livestream [Video]. YouTube. <https://www.youtube.com/watch?v=outcGtbnMuQ>
21. Thormundsson. B. 2024., *Global user demographics of ChatGPT in 2023, by age and gender*. [Online] Available at: <https://www.statista.com/statistics/1384324/chat-gpt-demographic-usage>
22. UNESCO. (2021a). *AI and education: Guidance for policy-makers*. UNESCO.
23. Xia, Q., Chiu, T. K. F, Lee, M., Temitayo I., Dai, Y., & Chai, C. S. (2022). A self-determination theory design approach for inclusive and diverse artificial intelligence (AI) K-12 education. *Computers & Education*, 189, 104582. <https://doi.org/10.1016/j.compedu.2022.104582>
24. Zeb, A., Ullah, R. and Karim, R., 2024. Exploring the role of ChatGPT in higher education: opportunities, challenges and ethical considerations. *The International Journal of Information and Learning Technology*, 41(1), pp.99-111.