

GENERATIVE ARTIFICIAL INTELLIGENCE (AI) IN EDUCATION: A CROSS-NATIONAL SURVEY ON UNIVERSITY TEACHERS' PERCEPTIONS ON THE USE OF CHATGPT

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Abstract

In November 2022, Open Artificial Intelligence (AI) launched the controversial generative AI tool named ChatGBT-plus or ChatGPT-4 (Chat Generative Pretrained Transformer) which has been available to users via the website in February 2023. Since then, its use in the classroom environment has been debated. Various scholars, especially in the field of computer sciences, provided insights into its functioning and genesis on its possible negative use and impact particularly in the education sector. Therefore, there is a need for teachers' and students' insights vis-a-vis this robot with a global perspective. This exploratory study on 236 university educators based in India revealed mixed perceptions of using ChatGPT as a learning and teaching tool. Surveyed educators are aware of it and its acceptance as teaching tool is still limited. In the conclusion, the study proposed potential research avenues about the use OpenAI in education.

Keywords: *ChatGPT, India, quality education, global south, OpenAI.*

1. Introduction

Information and communication technologies (ICTs) promote inclusive education (Fu, 2013; Kent & Facer, 2004; UNESCO, 2023). However, the World Bank (2023) worries that some nations in the Global South lack these resources. Therefore, the use AI powered technologies would be possible solution for bridging this gap (Kshetri (2023)). However, the emergence of ChatGPT-plus or ChatGPT-4 become a debatable topic among individuals in both the Global North and South as it would hamper teaching and students' learning. Some problems are plagiarism, cheating, copyright and misinformation among many others. (Adeshola & Adepoju, 2023; Dai et al., 2023; Huallpa et al., 2023; Murriss, 2023; Wu et al., 2023). ChatGPT-4 resulted from the innovation known as Artificial General Intelligence (AGI) that emerged in 2015 (Zhang et al., 2023). The model was upgraded to Open AI five, then in 2021, it changed to Codex, and in April 2022, it became Dall-E2. The latter led to the ChatGPT-4 that was released in April 2022, and since February 2023, the new version of ChatGPT, known as ChatGPT-plus, has been available to users via the websites (Zhang et al., 2023). Various individuals question the credibility of its content and use, including Sam Altman, the founder of OpenAI (Zhang et al., 2023). Scholars have mainly carried out conceptual studies about this technology, ethics, and copyright (Dai et al., 2023; Trivedi et al., 2023; Zhong et al., 2023). Scholarships about OpenAI, such as ChatGPT, should shed some light on its use among educators and students in the Global South nations as researchers claimed ChatGPT would benefit sectors like education and healthcare in developing economies (Kshetri, 2023). As computer-based technologies intercept learning, much of the debate is centered on its positive use and misuse. This study aims to find out the Global South university teachers' perceptions vis-à-vis the use of ChatGPT with a case study of India, and other three sub-Saharan nations. Such geographical locations were selected due to having English as the medium of instruction. However, this study's data are about India, as the researchers are still collecting data about the other three countries.

2. Information and Communication Technology (ICT) for education in the global south

Information and Communication Technologies (ICTs) in education refer to computer-based technology used for teaching and learning purposes (Kshetri, 2023). The effective use of ICTs helps in both formal and informal education, with the use of computers, the Internet, and other electronic tools such as phones, radio, and television. These tools are paramount in promoting inclusive education as they help create the e-learning environment. The computer-based technologies help students practice their courses at

school and home 24 hours a day and “learning can occur anytime and anywhere” (Fu, 2013, p. 112). Despite these benefits of using ICT in education, the global south still lags behind due to lack of adequate resources (Alharbi, 2023; Department for International Development, 2005). The Internet is yet to reach the grassroots for information and education. The COVID-19 pandemic showed the need for Internet for education in urban and remote areas. The COVID-19 pandemic also ushered in teaching learning technologies that were never thought of before. Students worldwide were connected to various ICT tools such as tablets, and many on mobile phones. Social media also became a mode of delivery of education, interaction, and entertainment (Suárez-Lantarón et al., 2022). Internet is also a tool for human empowerment and promoting inclusive ideas and education. However, World Bank found that there is a huge gap between developing nations and industrialized nations when it comes to internet access. One-third of the world’s population “remains offline in 2023” (para.3). The findings showed that only one in four individuals in low-income countries use the Internet (World Bank, 2023). This is an alarming finding because accessing ICT, such as the Internet, can help address various issues, including illiteracy among the inhabitants of developing nations (Karan, 2008; Selmi, 2023). However, a large portion of the population is disconnected from the rest of the world and many people in developing nations are under 30 years old (World Economic Forum, 2022). The nations are urged “to prepare young people to participate in the global knowledge economy” (Samarakoon et al., 2017, p. 646).

3. ChatGPT use in education: Benefits and challenges

ChatGPT, an OpenAI robot, has attracted several researchers’ attention in the last two years (Dai et al., 2023; Wu et al., 2023). This OpenAI technology has had four main generations (Wu et al., 2023). The GPT-1 was launched in June 2018, and its main data sources were BooksCorpus and Wikipedia. In February 2019, the system was upgraded to GPT-2 with 40GB of pre-training data, and the webText was its main data source. A year and three months later, the GPT-3 emerged with the Common Crawl as the main source of its data. The current GPT-4 started in March 2023 with the “unpublished” data source (Wu et al., 2023, p. 1123). This technology is powered by artificial intelligence-generated content (AIGC), which enables users to create content such as images, texts, and videos (Wu et al., 2023). The ChatGPT provides prompt responses. It remains a powerful and trustworthy tool due to generating content in various languages, but generated content is problematic because of containing numerous mistakes. (Wu et al., 2023). Despite this advancement, which it timely executes multitasks, ChatGPT has become a debatable topic. There are mixed feelings and feedback about its use in education. According to Adeshola and Adepoju (2023), the emergence of the ChatGPT posed many challenges, such as the violation of academic integrity and honesty. Therefore, Adeshola and Adepoju (2023) recommended that academic institutions work out guidelines about AI-generated text. There are also mixed opinions towards the use of ChatGPT among higher education users. The findings of a recent study showed multiple ethical issues posed by ChatGPT use (Huallpa et al., 2023; Stahl & Eke, 2024). For example, Stahl and Eke (2024) realized that there are issues related to this language-generative AI, such as the concerns about “responsibility, inclusion, social cohesion, autonomy, safety, bias, accountability, and environmental impacts” (Stahl, & Eke, 2024, p. 1). The authors argued that finding the sources to attribute responsibility and authorship would be challenging. Moreover, its specific sources of information sometimes remain unknown to the users. It can also promote Western culture because of the under-representation of data about developing nations (Kshetri, 2023; Wu et al., 2023). Despite these criticisms, other studies findings also showed that the effective use of ChatGPT can be beneficial for various sectors such as health, tourism, agriculture, transportation and serving as a resource hub for developing nations (Dwivedi et al., 2021; Javaid et al., 2023; Kshetri, 2023). Therefore, there is a need to conduct an empirical study to determine the use of ChatGPT. This study aims to address four research questions:

RQ1. What computer-based resources do teachers in higher education access in India?

RQ2. What are teachers' existing knowledge of using ChatGPT in higher education in India?

RQ3. To what extent are the faculty prepared to use ChatGPT when teaching in India?

RQ4. What are the teachers' perceptions about using ChatGPT in learning and teaching activities in India?

4. Method

The researchers conducted an online survey of seventeen questions to address the research questions. Surveys allow researchers to collect large numbers of data across various variables (Wimmer & Dominick, 2014). Southern Illinois University-Carbondale’s Institutional Review Board (IRB) approved this cross-national study. Questions aimed to test teachers' understanding of using ChatGPT in education, teachers’ habit in ICTs, and teachers’ readiness and appreciation vis-a-vis the role of ChatGPT in education. The online survey opened on February 15, 2024, and closed on March 11, 2024, at midnight central standard

time (CST), U.S. These respondents were selected using the nonprobability method with purposive sampling to reach out to the faculty and the snowball approach to increase the chances of increasing the number of participants (Wimmer, & Dominick, 2014). In the data analysis, the researchers primarily used descriptive statistics and inferential statistics to test any possibility of differences among the respondents' age, gender, and academic disciplines when using ChatGPT.

5. Findings & discussion

5.1. Socio-economic profile of respondents and internet access

Of the 240 respondents who opened the survey link, 98.3% (i.e., 236) have completed the survey. Of these 236 respondents, 60.6% ($M=1.39$, $SD=0.49$) were female. The researchers considered responses marked as 100%. A majority of the respondents were 36-45 years (44.4%), followed by 25.4% of 46-55 years, 23.3%, were aged between 25 and 35 years, while only 6.8% were 56 years or older. Most of the respondents (67.4%), work for private colleges, while 16.1% work for public universities, and 13.6% teach at semi-public colleges. Further, almost as a quarter, 22.9% (the highest number) have 11-15 years of teaching experience, 21.2% have 16-20 years, 19.1% have 21 years or more years, while 16.9% have 6-10 years and 6.8% stated that they have less than two years of teaching experience. About 44.5% mainly teach undergraduate courses followed by 26.3% who teach master's courses. Only 5.1% of the respondents mainly teach doctoral courses. Regarding the academic programs, 60.6% affiliate with STEM programs, 25.8% for Social Sciences, and 12.7% work for humanities, and 0.8% (i.e., two respondents) did not specify their affiliated programs. Interestingly, 50% have intermediate computer skills, 31% believe their computer literacy is advanced, 19% consider themselves experts, and 9.7% are beginners.

5.2. The computer-based resources teachers use

The first research question addressed the computer resources used by teachers. The findings showed that the highest number of participants (19.9%) used their personal computers. The second most used tool is mobile phones (12.7%). About 6.8% of respondents use school computers or tablets, and 5.9% used their other school electronic tools. Further, when asked about the frequency of using computers when teaching, preparing for courses, and grading students' activities, 35.6% of respondents often use computers when teaching, while 22.9% use computer-based technologies when grading students' work and only 26.3% use computers when checking for students' work authenticity or for plagiarism. Even if this finding cannot be generalized to the entire country in India, it reflects the claims about the lack of computer resources. Therefore, there is a need for teachers to have access to computers in the education sector.

5.3. Teachers' knowledge about ChatGPT and readiness to use

In this exploratory study the next questions related to the awareness of ChatGPT and its uses in their work. The questions about ChatGPT use were restricted to the respondents who did not know what ChatGPT is. In this context, the findings showed that most of them (i.e., 85.2%) knew or heard of ChatGPT. Of this number, 62.7% of respondents heard of it a lot, 58.7% heard of it in 2023 for the first time, and 5.1% heard of ChatGPT 3 to 5 years ago. Interestingly, 50% stated that they used ChatGPT. When asked, the purpose of their use, the respondents stated that they used it for personal and academic purposes. Precisely, some respondents wrote: "Research purpose and to acquire and search new information"; "random, make pictures, write poetry"; "edit, translation and rewrite a copy. "Sometimes, look for better ways to use the platform for a positive outcome"; "to have different lines and words"; "content for making presentations"; the online material which is not available in [G]oogle search or sometimes to know the validity of material"; "computer programming language purpose". These responses support Kshetri's (2023) argument about the use of ChatGPT as a source of data. However, it must be clear that it is not yet the source to which the information can be attributed. When asked about their perceptions of using ChatGPT as a teaching tool, it was found that the teachers had mixed feelings. Only 47.3% agreed with the statement about the assumption that ChatGPT would improve students' research abilities. The study also showed that more than a third 36.3% neither agreed nor disagreed with the assumption that ChatGPT will negatively affect students' academic performance. Further, 38.3% do not trust ChatGPT content. About allowing the students to use ChatGPT, 65.2% indicated that they would (somewhat) likely allow their students to use AI-powered tools in the future, even if its use might be normalized. Moreover, 59.7% of the respondents are somewhat agreeable to using ChatGPT in the classes, if they get an opportunity to be trained. Considering this finding, the educators remain undecided or skeptical about using generative AI in the classroom environment (Table 1)

Table 1. Teacher's perception about the use of ChatGPT.

S/N	Statement	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
1	ChatGPT and research skills	31(15.4%)	95(47.3%)	48(23.9%)	20(10%)	4(2.0%)
2	ChatGPT and academic performance	19(9.5%)	61(30.3%)	73(36.3%)	28(13.9%)	4(2.0%)
3	Training on ChatGPT	28(13.9%)	107(53.2%)	31(15.4%)	15(7.5%)	1(0.5%)
4	Trusting ChatGPT content	9(4.5%)	27(13.4%)	77(38.3%)	61(30.3%)	5(2.5%)
5	ChatGPT and preliminary research	18(9.0%)	98(48.8%)	42(20.9%)	16(8.0%)	7(3.5%)
6	Advising students to use ChatGPT	31(15.4%)	85(42.3%)	32(15.9%)	22(10.9%)	10(5.0%)
7	Students' cheating, plagiarizing	23(11.4%)	74(36.8%)	59(29.4%)	21(10.4%)	2(1.0%)

The researchers further tested whether there was any significance between some variables such as academic discipline, years of experience, gender and perceptions. On the academic discipline variable, one-way ANOVA was conducted because there were more than two factors (i.e., Humanities, Arts and Social sciences, and STEM) to determine whether the perceptions about ChatGPT use are statistically significant. The findings showed that the p-values were not statistically different, as the p-value was above 0.05. Therefore, it was found that teachers tend to have similar attitudes toward ChatGPT. An independent t-test was also conducted to test whether the perceptions toward ChatGPT depend on gender. Findings showed the t-scores for two variables (i.e., fifth and sixth statements). There was a significant difference in females' perceptions ($M=2.52$, $SD=0.98$ and male's perceptions ($M=2.26$, $SD=.81$); $t(181)=1.85$, $p=0.033$) and on statement six, female's perceptions ($M=2.59$, $SD=1.14$ and male's perceptions ($M=2.12$, $SD=.094$); $t(180)=2.87$, $p=0.002$). However, it would be too simplistic to argue that gender plays a role in perceptions about ChatGPT.

6. Conclusions

The findings from the survey addressed the four research questions. A few respondents stated that they use computers when teaching. The findings also showed that the teachers are aware of ChatGPT, but had mixed feelings toward using ChatGPT as teaching or learning material. For example, 59.7% are somewhat agreeable on using ChatGPT in the classes if they get an opportunity of being better informed and trained. Despite this tendency to rejecting ChatGPT as a legitimate tool for education, respondents expressed interest in being trained about its use. Surveyed teachers also consider ChatGPT a research resource and not as a threat to their work. This is unlike past studies (Adeshola and Adepoju, 2023; Stahl and Eke, 2024; Zhang et al., 2023) where ChatGPT is being considered as a concern to educational institution on issues of plagiarism and cheating. This exploratory study's findings fill the gap in the use of ChatGPT among educators in Global South nations. This study also brings another major finding with reference to Kshetri's (2023) study where the findings showed that ChatGPT would benefit sectors like education and healthcare in developing economies. The findings from this study can serve as a point of reference for expanding to other nations located in Southern Asia or Sub-Saharan Africa. Future researchers can explore the influence of people's academic discipline on accepting or rejecting this fast-growing OpenAI tool in education, but it would be used with caution and its better understanding could be a solution. Therefore, in-depth studies about the teachers' and learners' points of view would help understand the users' assessments of technologies, such as OpenAI in education. Given possible negative consequences associated with ChatGPT, there is a need for building a comprehensive teaching framework about the use of OpenAI by focusing on its benefits and mitigating possible challenges.

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