"Implications of ChatGPT: Insights from the Higher Education of Pakistan"

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KEY WORDS	ABSTRACT
	The Higher Education (HE) of Pakistan, despite all technological challenges in the region, demonstrated improved openness towards accepting technology in the post-COVID era and should be included in forming the global consensus on the educational impact of ChatGPT. This mixed-method research provides insights on the usability patterns, possibilities to advance pedagogy, and limitations presented by ChatGPT across the disciplines of Social Sciences, Humanities, Pharmacy, and Business Education at a renowned private university in Pakistan. Findings of this study indicate the spectrum of possibilities with ChatGPT and potential challenges pertaining to academic integrity, users' social competence, and reliability and accuracy of information. Based on the analysis of outcome, this study also suggests a way forward through actionable recommendations to facilitate ethical use of ChatGPT. Lastly, this study identifies significant perspectives for future research to wholesomely understand the implications of ChatGPT on the HE of Pakistan.

Introduction

The Coronavirus pandemic proved to be a black swan event for the Higher Education (HE) of Pakistan and despite the deeply entrenched inequalities in access and user digital competences, the HE witnessed a rapid shift to remote and online instruction to mitigate disruption in education (Raza, 2022). Although the quality of digitized instruction in Pakistan is a contested topic but the COVID-19 resulted in revolutionizing practices at micro- (course planning, deployment, and instruction), meso- (program level), and macro-level (leadership and management of HE) (Asher, 2021). The accelerated digitalization in HE encouraged instructors to test educational affordances of new technologies. The recent development in ChatGPT, an artificial intelligence driven generative pretrained language model, has caused a ripple effect in the global realm of teaching and learning. Although it has been applied to a wide range of operations in the HE, a global perspective on its academic value is still in the making. The purpose of this article is to report insights on usability and challenges of ChatGPT in HE from Pakistan to contribute to the global perspective towards this new tool.

Literature Review

Launched in November 2022, ChatGPT has taken the world by storm. The current active users of this technology are over 200 million and it is expected to reach over 550 million by 2024 (UNESCO, 2023), thus signifying this artificial intelligence as the world's most impactful digital tool for a wide range of industries (Lund & Wang, 2023). As of March 2023, approximately 15 million users of ChatGPT were recorded to represent various geographic regions across Pakistan (Quora, 2023).

ChatGPT is a language processing model that uses a combination of Generative Pre-trained Transformer (GPT) and contextualized dialogue management technique to offer a unique attribute of composing coherent human-like responses on a range of topics (Dwivedi, et al., 2023). ChatGPT contextualizes language output according to users' expectation by tracking input requests over a range of time and inferring user activity across other applications (Bozkurt, et al., 2023). It generates highly sophisticated language products, mostly indistinguishable from content composed by a human language expert. The usability of ChatGPT has been demonstrated through use cases around the world across a range of activities such as generating research output, essay writing, pedagogy, and linguistic art (Tilili, et al., 2023). The usability and impact of ChatGPT on teaching and learning is a topic of on-going research. Several emerging themes in the existing literature on the usability of ChatGPT report advantages as well as potential risks associated with plagiarism and compromised learning (Bozkurt, et al., 2023; Tilili, et al., 2023). Although, ChatGPT has shown remarkable capabilities of generating sophisticated responses it has a definite downside of not being able to promote users' higher order thinking skills or critical thinking (Zhai, 2023). Researchers fear that this may result in users' dependency on the chatbot limiting their cognitive advancement and catalyzing a steep decline in their long-term performance in demonstrating reflective thinking (Shidiq, 2023; Eke, 2023). There is also an increasing debate

on difficulty to distinguish between machine generative text and human authorship which imposes great challenges to assessment of learning outcomes (Bozkurt, et al., 2023).

The possible negative impact of ChatGPT on learners' attitudes and academic performance is still a debatable topic and one cannot find an indication of unanimous agreement by researchers that ChatGPT is a threat to the realm of Education. In fact, more nuanced research perspectives advocate its potential role to revolutionize teaching and learning processes as a standalone or an integrated tool in academia (Atlas, 2023; Tilili, et al., 2023). ChatGPT has the ability to facilitate learners in a myriad of experiences through personalizing their learning experiences, helping them to navigate through conceptual spaces, and understand complex data and information through artificial intelligence interpretation (Atlas, 2023). This technology is also known for its ability to enhance inclusivity for individuals struggling with a particular language (Shidiq, 2023) by picking up their context through the given prompts. Eke (2023), argues that ChatGPT also has the potential to improve learners' efficiency and effectiveness through better time management and by providing automated feedback on their work. Lund and Wang (2023), explore exhilarating advantages of ChatGPT in research and academic setting and report its overwhelming advantages for academia and librarianship through the affordances in advanced discovery, intelligent content creation, smart cataloging and metadata generation. Their study also surfaces paramount issues in academia pertaining to privacy, autonomy, accountability,

responsible and ethical use of ChatGPT (Lund & Wang, 2023).

At the time of this study, most cases studies that report the impact of ChatGPT on HE originates in technologically developed societies that have demonstrated pedagogical innovation in the past (Kshetri, 2023). It is essential to collect insights from other countries, especially the ones still struggling to sustain technology integration in the post-COVOD era, for a better and wholistic understanding of the educational implications of ChatGPT (Sultan, Khan, Lee, & Oo, 2023). With this background, the objective of this study is to systematically explore usability patterns and potential risks posed by ChatGPT to the faculty of Business Administration in the HE of Pakistan. Based on the analysis, this study also proposes actionable strategies to promote academic use of ChatGPT in Higher Education.

Materials and Methods

This study employs a mixed-method case study approach to accomplish the aforementioned research objectives (Yin, 2017). The research deign is based on the principles of instrumental case study design (Taber, 2014) which tests a phenomenon in a particular context, in this case the educational value of ChatGPT idiosyncratic to the context of Pakistan. Forty-five instructors from a private university in Lahore were randomly selected from the Faculty of Social Sciences, Humanities, Pharmacy, and Business Administration to participate in this study. The university where this research had taken place provides a stable digital infrastructure and all participants are experienced in using education

technology in online and hybrid mode of teaching.

A five-point Likert Scale questionnaire (1=never use, 2=rarely use, 3=sometimes use, 4=often use, 5=very often use) comprising of 42 items was used to determine the patterns of usability (domain of application and frequency) and challenges related to the use of ChatGPT. The internal reliability of this research instrument was measured in terms of Cronbach's Alpha and determined as high at 0.87 (Clarke & Clarke, 2018). The data was triangulated through investigation of user experiences by a series of four focus group discussions. These discussions were reflections on the entire process from expectations to experience and were navigated under three themes of perceived usefulness (PU), perceived ease of use (PEU), and actual use of ChatGPT. Results from the focus group discussions were thematically analyzed through manual coding process. The average time of focus group discussion was 85 minutes.

Results

The generative chatbot is here for good and reducing or eliminating its use in teaching, research and learning is not sustainable. Table 1 shows that the participating instructors used ChatGPT to accomplish a wide range of tasks.

Table 1 Domains of Use of ChatGPT by Instructors

Items	Percentage (%)					Mean	SD
Use ChatGPT for:	*1*	*2*	*3*	*4*	*5*		
Brainstorming	3	12	5	74	6	3.37	0.63
Planning of learning Outcomes	4	31	12	48	5	3.07	0.60
Designing teaching resources	2	4	6	8	78	3.21	0.57
Designing quizzes/ exercises/ other forms of assessments	4	6	8	11	71	3.11	0.61
Developing Rubrics for Constructed Response Items	5	9	5	8	73	3.05	0.59
Generating personalized feedback on students' work	5	33	16	14	32	3.39	0.62
Research	2	4	4	12	78	3.48	0.55
Language translation	28	20	22	16	14	3.21	0.59
Access information in own discipline	6	31	34	11	18	3.14	0.48
Summarizing texts/concepts	3	2	6	5	84	3.53	0.45
Communicating with students	26	20	16	20	21	3.62	0.58
Grading essay-type assignments	4	4	8	14	70	3.72	0.48

1=Never, 2= Rarely, 3=Sometimes, 4=Often, 5=Frequently

These results reinforce the efficacious nature of ChatGPT reported in literature by increasing time efficiency in performing tasks related to resource preparation, designing unique learning prompts and discussion topics (Atlas, 2023; Shidiq, 2023). The result of descriptive analysis confirm that most instructors use ChatGPT for assisting them in their administrative workload such as: summarizing concepts (84%), designing teaching resources (78%), designing exercises or quizzes (71%), developing rubrics (73%), and researching on a given concept (78%). There is an increasing pattern in using ChatGPT for staying updated with new developments in their respective discipline and to employ this technology for personalizing

recommendation for students to advance their academic performance. Research indicates that personalized feedback tailored to the needs of students provides dialogic information and remedial activities to enhance academic performance (Bulut, Cutumisu, Aquilina, & Singh, 2019)

The emerging themes from focus group discussions, presented in Table 2, compliment instructors' perception that ChatGPT has the potential to drastically improve teaching practices. The respondents of this study took advantage of the communicative nature of ChatGPT and utilized it for exploring information related to their discipline. While actually working with this resource of artificial intelligence, most instructors found it responsive and user friendly due to an easy interface that does not require any special technical skills.

Table 2 Summary of Emerging Themes from the Focus Group Discussions

Focus Area	Emerging Theme
Perceived Usefulness of ChatGPT	Information Retrieval
	Database for new business study models
	Database of marketing case studies
	Generating teaching resources
Perceived Ease of Using ChatGPT	Responsiveness
	Basic IT handling skills
	User interface
Actual Usage of ChatGPT	Teaching Assistant
	Designing informal assessment
	Developing unique teaching resources
Challenges	Plagiarism
	Social implications
	Lack of consensus on terms of use
	Accuracy and reliability of all information

ChatGPT is a revolutionary Artificial Intelligence (AI) service which has the unique characteristic to generate human-like text content however, this technology also offers some challenges to its users especially if used for teaching and learning (UNESCO, 2023). This research reinforces some challenges previously reported in literature such as, the risks associated with academic integrity (Eke, 2023; Bozkurt, et al., 2023; Dwivedi, et al., 2023; Lund & Wang, 2023) and accuracy of information produced by ChatGPT (Tilili, et al., 2023; Zhai, 2023). Respondents of this study also indicated towards social implications of Human-Technology interaction. Respondents fear that this technology has the potential to isolate users from their real environment and can result in excessive reliance. A study at De Montfort University, UK reported that ChatGPT is likely to build a sense of dependency among users for its employability as a search engine rather than being used as a generative language model (Eke, 2023). This study also surfaced another challenge related to the implications of ChatGPT on social competence of users. Participants expressed their concern on the possible impact of this AI to limit human interaction for learning. There are contrasting findings from other parts of the world, a research at Foothill College concludes that ChatGPT is likely to help students with communication difficulties thus improving their confidence to interact with peers (Stefonik, 2023). Another research from Indonesia indicates that excessive use of ChatGPT may lead to low self-efficacy which has a negative impact on users social competence in their environment (Shidiq, 2023). The impact of ChatGPT on users social competence requires further probing by experts.

Recommendations on Ethical Use of ChatGPT in Pakistan

This section summarizes participants' suggestions on essential strategies that academia should seriously consider in order to mitigate risks of using ChatGPT to improve process and experience of . learning for students.

1- Higher Education in Pakistan should embrace ChatGPT to keep abreast with the world in which artificial intelligence has become an inevitable resource for learning. HEIs should educate students and instructors on using artificial intelligence by introducing 0-credit courses that discuss ethical use, benefits, limitations, and way to respond to challenges while working with ChatGPT and other AI resources.

2- Just how HEIs in Pakistan developed collaborated national guidelines for teaching online during the educational revolution of COVID-19, opportunities should be created for faculty members, leaders, and administrators to engage in co-creating context-sensitive guidelines to practice ethical use of ChatGPT in a range of professional roles.

3- HEIs must review and revise policies pertaining to academic integrity and introduce appropriate resources to detect plagiarism in relation to ChatGPT and other AI tools.

4- Instructors should set clear guidelines for the use of ChatGPT and communicate those to the students. These may include guidelines on when to use ChatGPT and how to provide citation for text generated by OpenAI (Cotton, Cotton, & Shipway, 2023).

5- HEIs should create university-based Professional Learning Communities (PLCs) for instructors to discuss their experiences of using ChatGPT and other AI resources in teaching different disciplines. PLCs are likely to set a culture of peer support and mentoring. Participants of these PLCs should also regularly review and suggest improvements in University-based policies pertaining to the use of OpenAI.

6- Higher Education Commissions, the central regulatory authority for HE in Pakistan, should device a mechanisms to collect data on application of OpenAI in academia and use this information to report the impact to the wider world.

Conclusion

ChatGPT is a revolutionary advancement in the realm of artificial intelligence and as a progressive society, the HE in Pakistan should fully embrace it by preparing instructors and students on ethical use of this innovation. This study confirms effectiveness of ChatGPT when applied to a wide range of disciplines and operations in the HE and its potential to benefit instructors by reducing their administrative workload, facilitating in developing unique and contextualized teaching resources, designing personalized assessment, generating rubrics, and using it for summarizing concepts. Like any other technology, ChatGPT also presents challenges to its users. The results of this study suggest that challenges pertaining to

academic dishonesty and plagiarism can be mitigated through a collaborative approach and by constantly adapting university policies and guidelines to address developments in the field of artificial intelligence.

It is important to further explore different perspectives of educational impact of ChatGPT to make informed decisions for better integration of artificial intelligence across micro-, meso- and macro-level of HE. This study does not assess students' perceptions about the academic affordances of ChatGPT which is necessary to develop a wholesome understanding of the impact of innovative artificial intelligence on the quality of HE in Pakistan.

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