ChatGPT And Artificial Intelligence in Higher Education Institutions: Benefits, Challenges and Ethical Concerns

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Abstract

ChatGPT and AI tools are gaining popularity among students for accomplishing their academic tasks which calls for research study in this area. Present research is aimed to analyze the benefits, challenges and ethical concerns about ChatGPT and AI tools usage by higher education students for academic purposes. Quantitative approach with descriptive research was adopted to carry out present research. 143 students from two public universities in Islamabad took part in research. Results exhibited that most students agreed on the benefits of AI tools for academic purposes. However, students also indicated concerns about academic integrity regarding the use of AI tools for academic purposes. Students further showed their concerns about regulations, information privacy, cognitive biases, gender & diversity, accessibility and commercialization of ChatGPT and AI tools while using them for academic purposes. Additionally, challenges and ethical concerns such as academic integrity, lack of regulation and cognitive bias significantly impact the usage of ChatGPT and AI Tools among students for academic purposes. It is recommended that students be provided training through workshops about the use of ChatGPT and AI Tools for academic purposes.

Keywords: ChatGPT, challenges, ethical concerns, higher education students

Introduction

Technologies based on artificial intelligence (AI) offer effective support for online learning and teaching by automating boring tasks for teachers and enabling adaptive evaluations. Despite the fact that there isn't a single, widely agreed-upon definition of artificial intelligence, it is generally agreed that machines created with AI "are potentially capable of emulating or even exceeding human cognitive capacities, including sensing, verbal interaction, reasoning and analysis, problem-solving, and even creativity." Artificial intelligence is a crucial part of modern education, offering a number of benefits for both students and teachers. One of its main advantages is that it can provide individualized learning experiences. Siemens (2013) claims that AI can analyze student data and dynamically change how content is presented. By tracking students' progress and preferences, AI systems may be able to adapt lesson plans to each student's learning pace and style, which will improve understanding and engagement.

Academics have recently centered more on how AI gives teachers better teaching and learning strategies (Cope et al., 2021). Along with providing personalized instruction, AI can ease the administrative burdens that instructors must bear. According to Anderson and Besser (2019), artificial intelligence (AI) technology can automate tasks like grading assignments and content creation. This automation not only saves time, but also gives teachers more time to focus on more crucial aspects of instruction like student mentoring and guidance. AI can also act as a substitute teacher, providing both teachers and pupils with useful assistance. ChatGPT and other AI-powered virtual assistants can assist students by responding to their questions and offering clarifications, claim Radford et al. (2019). Due to

the real-time assistance, which promotes independent learning, students may readily understand complex concepts.

Accessibility is a further area in education where AI can have a significant impact. Alkhowailed et al. (2019) claim that by providing alternative formats for instructional content, AI tools can increase accessibility. For students with disabilities or various learning needs, AI can offer text-to-speech conversion, image explanations, and other adaptations, ensuring that education is accessible to all. AI is significantly influencing new educational formats like blended learning, flipped classrooms, MOOCs, and others with its scalable applications, which are revolutionizing educational practices on a worldwide scale (Al Braiki et al., 2020; Zhang et al., 2020). Additionally, AI supports data-driven decision-making in educational institutions. According to Zawacki-Richter et al. (2019), artificial intelligence (AI) systems have the capacity to analyze vast amounts of student data and generate insights that aid organizations in enhancing their courses and support services. By identifying patterns and potential areas for growth, AI helps schools make informed decisions to enhance the entire educational experience. Finally, Chatbots powered by AI provide quick support to online students. The quick assistance and direction that AI Chatbots may offer students in online learning contexts is highlighted by Hsu and Wu (2016). These Chatbots improve the online learning experience with their quick responses, study advice, and information requests.

Finally, how we teach and learn is changing as a result of the usage of AI in education. AI is revolutionizing education for the benefit of both students and instructors, from customized learning experiences and administrative support to accessibility improvements and data-driven decision-making. Accessibility is

another remarkable aspect of ChatGPT. Unlike many AI-powered content generators that may have access limits or require specific memberships, ChatGPT is accessible to all users. A wide range of people and applications can benefit from cutting-edge AI thanks to this openness, which democratizes access to the technology. The extraordinary capabilities of ChatGPT have been recently recognized in reports. Choi et al. (2023) demonstrated that ChatGPT passed a Law school exam to highlight its potential in academic and professional settings. In a similar spirit, ChatGPT performed well on an MBA exam, according to Terwiesch (2023). These successes demonstrate ChatGPT's adaptability and skill across a variety of industries, further solidifying its status as a strong and efficient AI tool. Here are a few applications of using ChatGPT in a university setting. Incorporating ChatGPT and other AI technologies in the context of higher education has numerous advantages. Johnson and Smith (2021) claim that ChatGPT serves as a virtual teaching assistant, swiftly reacting in real time to inquiries from students and offering invaluable assistance with concerns relating to courses. Additionally, Andersen and Brown (2020) stress its role in providing individualized tutoring, which adapts lesson plans and content to meet the unique requirements and learning preferences of each student. According to Johnson and Smith (2021), ChatGPT becomes a valuable resource in higher education because it serves as a virtual teaching assistant. Its features include real-time student question responses and substantial assistance with a variety of course-related problem. Both teachers and students profit from this cutting-edge AI-driven technology because it not only facilitates more effective communication but also produces a more dynamic and engaging learning environment. By utilizing ChatGPT's features, teachers can speed up their lesson plans, concentrate on teaching more difficult concepts, and

provide students with immediate, individualized support throughout their academic careers.

Although these applications have many benefits, it is crucial to be aware of the ethical and practical concerns that the use of AI in education poses. Concerns around data privacy, bias in AI algorithms, and the need for appropriate training and supervision to enable ethical AI usage are a few of them. Therefore, a balanced approach is needed to adopt ChatGPT in higher education so that it can achieve its full potential while addressing these new issues. Making sure that precise and high-quality responses are delivered, particularly in difficult domains, is a problem that ChatGPT and related AI Chatbots face. Data privacy is a significant issue that involves the processing and protection of student data used in AI-driven educational systems in order to prevent breaches and misuse (James & Brown, 2019). In addition, addressing racism in AI is essential to prevent biases that may exist in AI models and sustain educational imbalances (DiAngelo & Smith, 2020).

The adoption of AI technology by all students, including those with disabilities, is made possible via accessibility (Johnson & Wilson, 2018). These challenges emphasize the need for careful consideration and AI implementation in education. In Anderson, C., & Smith, R. (2021), the difficulties in maintaining the quality of AI-powered educational assistants are discussed.

The usage of ChatGPT and comparable AI technologies in academic settings offers some threats and ethical problems to academic integrity because students may develop content using these tools without giving proper credit (Bretag et al., 2019). The employment of AI-powered technologies for plagiarism and cheating is one such hazard. Additionally, Murdock and Anderman (2006)

claim that students may use AI programmes to receive unauthorized assistance with their assignments, quizzes, or exams. Students may attempt to circumvent these systems by exploiting AI-generated content, even though AI can help identify plagiarism (Park, 2003). Giving credit where credit is due when employing AI tools might be challenging to do ethically in academic settings (Lipson, 2021). Privacy challenges with data protection and consent arise when AI systems collect and analyses student data (Boyd & Crawford, 2012). AI may be abused by students or other individuals to produce phony academic or research content (Brundage et al., 2018). Furthermore, it may be challenging to identify the authors of academic papers that make use of AI (Shankar, 2020). By resolving these concerns, the integrity of the educational system must be preserved.

As educational systems explore the integration of AI into conventional classrooms, online platforms, and mobile learning management systems, it is critical to strike a balance between efficiency, benefits, security, and other considerations (Hagendorff, 2019; Abrams et al., 2019). Discussions about the ethical implications of AI in education started around 20 years ago (Aiken & Epstein, 2000), and today numerous well-known technology companies have their own AI ethics panels (Lee, 2019). However, given the continuously evolving nature of educational AI technology, particular AI ethics guidelines are necessary. Furthermore, it is critical to address privacy concerns in the context of AI in education. Significant gaps and exclusions were discovered in a recent semi-systematic examination of 22 AI ethics standards, highlighting the need for comprehensive AI ethics frameworks that include crucial topics.

If academics want to address the problems and ethical dilemmas related to the integration of ChatGPT and related AI technologies in higher education, they

must be thorough and proactive in their approach. Following are some strategies and ideas that educational institutions might employ:

With a focus on principles like fairness, accountability, and openness, academic institutions should create and follow clear ethical rules and procedures that will regulate the use of AI in education (Anderson & Smith, 2021). Second, conducting fairness audits of AI systems in order to identify and address biases should be a primary goal. Adversarial training and debasing are two techniques that can be used to overcome these issues (Hardt, Price, & Srebro, 2016). It is imperative to strengthen data privacy and security protocols in order to safeguard student data. Aspects like access controls, encryption, and ensuring that data protection rules are adhered to are essential (Whitman & Mattord, 2018). Transparency in AI systems is crucial. It is important for all parties involved, including students and teachers, to comprehend and be able to articulate these algorithms (Doshi-Velez & Kim, 2017). Training and instruction on data protection, AI ethics, and ethical AI use in the classroom are essential for administrators and educators (Floridi & Cowls, 2019). Collaboration with business experts, ethicists, and regulatory bodies is crucial to ensuring the moral application of AI in higher education (Diakopoulos, 2016). AI systems used in education need regular audits and evaluations to spot and fix ethical and fairness issues (Holzinger et al., 2017).

Last but not least, Henry and Chapman (2017) contend that diversity and accessibility should be considered while developing AI technology for use in education. They will be able to satisfy the various demands of students as a result. The rapidly advancing development of AI technology and its extensive set of features and functions bode well for the future of the educational industry. In order

to fully realize the benefits AI offers to education, it is essential to create links that bridge the gap between technological breakthroughs in AI and its practical implementations in educational settings. By putting these activities into practice and incorporating ethical considerations into the deployment of AI, academia may make substantial progress in addressing the challenges and ethical concerns associated with the usage of ChatGPT and AI in higher education.

Objectives

Investigate the benefits of using ChatGPT and AI tools by higher education students for academic purposes.

Analyze challenges and ethical concerns about using ChatGPT and AI tools by higher education students for academic purposes.

Find out the impact of benefits of using ChatGPT and AI tools on students for academic purposes.

Determine the impact of challenges and ethical concerns of using ChatGPT and AI tools on students for academic purposes.

Hypotheses

Ho1: Benefits of ChatGPT and AI tools do not significantly impact their usage by students for academic purposes.

Ho2: Challenges and ethical concerns about ChatGPT and AI tools do not significantly impact their usage by students for academic purposes.

Significance of Study

Present research is momentous due to the increasing use of AI tools among students for academic purposes. This calls for serious attention from researchers and faculty members. Present research collected information from students about their viewpoints on benefits, challenges, and ethical considerations.

Recommendations of the study will be beneficial for faculty, students, and AI generators in many ways. Teachers may review their philosophies while keeping in view of the AI tools. The results of the research will also serve as guidelines for future researchers. AI tool generators may consider the results and suggestions of present research when updating and further improving the tools.

Framework of Research

Various research studies helped to develop a questionnaire section of present research regarding the benefits of ChatGPT and AI (Andersen & Brown, 2020; Cope et al., 2021; Johnson & Smith, 2021; Zawacki-Richter et al., 2019). Moreover, for developing a section on challenges and ethical concerns, the research study of Sabzalieva and Valentini (2023) was considered which discussed academic integrity, regulation, privacy apprehensions, cognitive bias, gender & diversity, ease of access, and commercialization as challenges and ethical concerns regarding the use of ChatGPT. These challenges and ethical concerns provided a basis for the present research. Present research conceptualizes the benefits of ChatGPT and AI in academic settings as the usefulness of these tools in the learning process for enhancement of knowledge and better performance. As far as academic integrity is concerned, higher education institutions are more worried about the higher risk of cheating and plagiarism due to use of ChatGPT and AI by students in their assessment practices and research. Other concerns regarding AI tools usage are regulation, privacy apprehensions, cognitive bias, gender & diversity, availability, and commercialization (Sullivan et al., 2023).

Research Methodology

Quantitative paradigm of research through descriptive research methods was chosen for carrying out the present research. Research questionnaire was

developed by researchers and is based on three main areas: benefits, challenges, and ethical concerns about the use of AI and ChatGPT in academic settings. Two experts validated the questionnaire and suggestions were accommodated accordingly. There was a total of 29 items with a five-point Likert Scale ranging from 'Strongly Agree' to 'Strongly Disagree'. Data was gathered through personal visits and Google Form.

Population and Sample Size

Students of two public universities in Islamabad took part in the study. 143 students finally filled out the research questionnaire. Students from the BS students (Bachelor of Studies Degree) were considered as sample of study. Convenience sampling technique applied for collection of data from sample of students.

Instrument Reliability

Table 1

Cronbach's Alpha Reliability

| Constructs	Cronbach's Alpha	N of Items
Benefits of ChatGPT and AI Tools	.835	6
Academic Integrity Concerns	.833	5
Lack of Regulation	.735	3
Privacy Concerns	.712	3
Cognitive Bias	.883	3
Gender and Diversity	.763	3
Accessibility	.761	3
Commercialization	.750	3

Results of Cronbach's Alpha reliability showed that all the values are within acceptable range.

Findings

Statistical tests such as mean score, standard deviation and multiple regression were used for analyzing data.

Figure 1

Use of Various Artificial Intelligence Tools for Academic Purposes
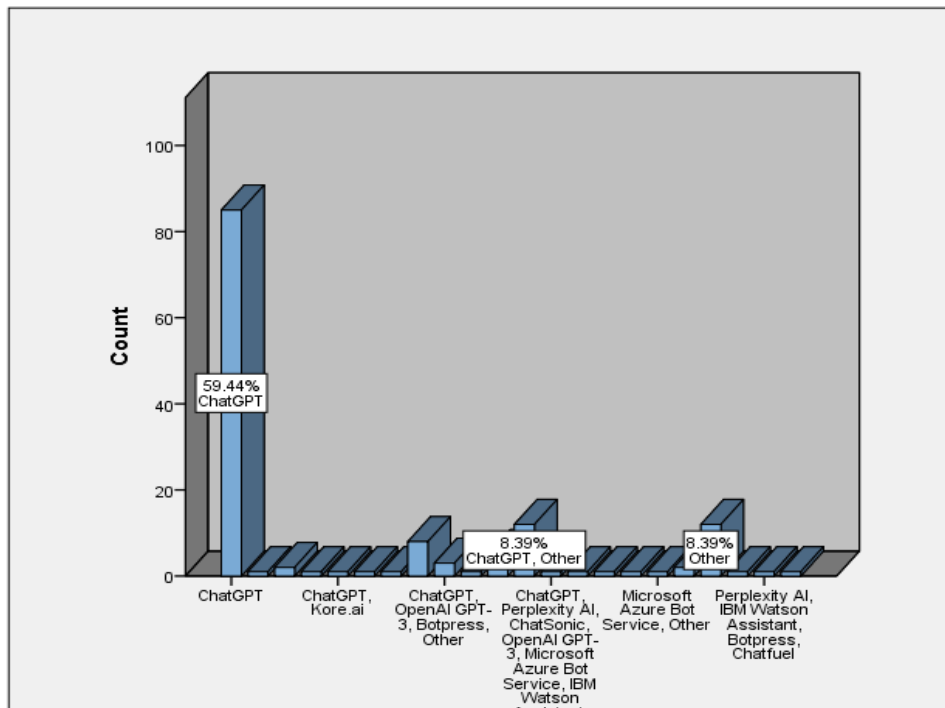
Results of Figure 1 revealed that students are using various Artificial Intelligence (AI) tools, however, ChatGPT is the tool that is frequently used by students for academic purposes. Other tools that are in use by students are Perplexity AI, OpenAI GPT-3, IBM Watson Assistant, Microsoft Azure Bot Service, Botpress,

Kore.a, Chatfuel, etc. However, the frequency of using these AI tools is low as compared to ChatGPT.

Figure 2

Usage of ChatGPT and AI Tools for Academic Purposes Across Benefits, Challenges and Ethical Concerns
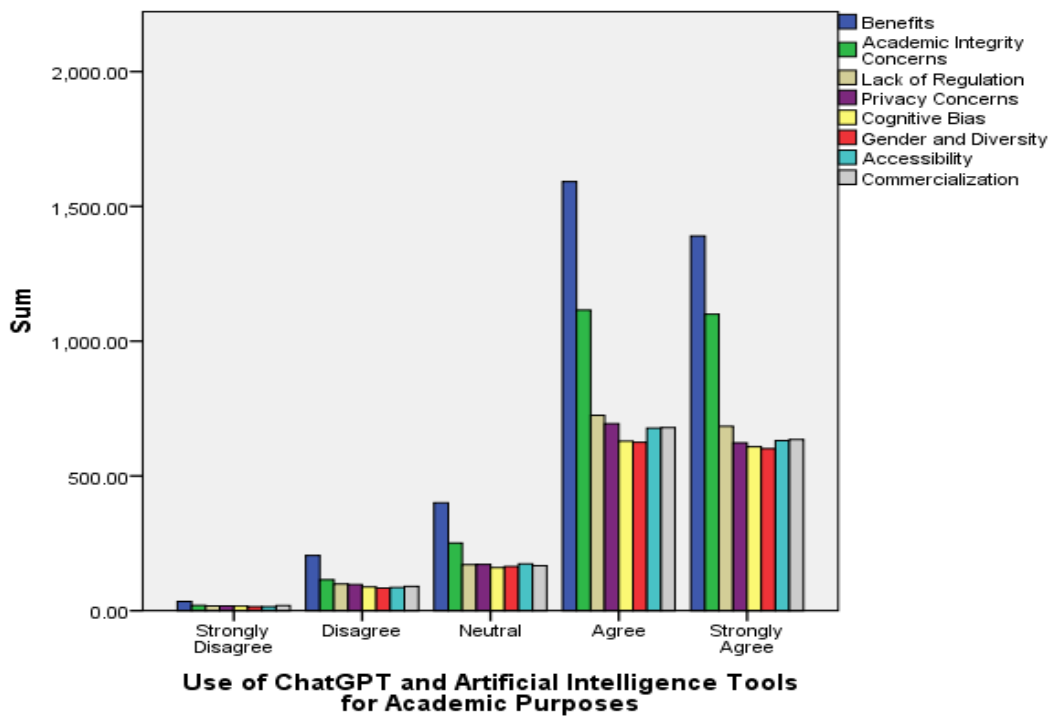

Figure 2 shows the usage of ChatGPT and AI tools for academic purposes such as generating class assignments, projects, and academic content from various perspectives. Most students responded in the category of Agree and Strongly Agreed about the benefits of AI tools for academic purposes. However, they also

showed concerns about academic dishonesty regarding the use of AI tools for academic purposes.

Table 2

Benefits, Challenges and Ethical Concerns Regarding ChatGPT and AI Tools

Variable/s.	Mean Score	Std. Deviation	Results
Benefits of ChatGPT and AI Tools	4.22	.564	Agree
Academic Integrity Concerns	3.63	.877	Agree
Regulation Concerns	3.95	.713	Agree
Privacy Concerns	3.73	.711	Agree
Cognitive Bias Concerns	3.50	.950	Agree
Gender & Diversity Concerns	3.47	.770	Agree
Accessibility Concerns	3.69	.709	Agree
Commercialization Concerns	3.70	.704	Agree

Results of mean scores indicated that students Agreed about the benefits of ChatGPT and AI tools for academic purposes (M=4.22). Although mean score results also showed that they are also concerned about academic integrity when using ChatGPT and AI tools for academic purposes (M=3.63). Students Agreed about the lack of regulation and the need for specific guidelines about the use of ChatGPT and AI tools for academic purposes (M=3.92). Students showed their concerns about the privacy of data while using AI tools and ChatGPT (M=3.73). Another challenge while using ChatGPT and AI tools for academic purposes is cognitive biases. Results indicated that students Agreed that system creators of AI tools and ChatGPT may make efforts to overcome cognitive bias (M=3.50). Students also showed their concerns that AI tools and ChatGPT should be

designed in a way that is unbiased and inclusive in terms of gender and diversity (M=3.47). Students also agreed that one of the challenges is the availability of AI tools and ChatGPT to every person (M=3.47). Results revealed that private firms design AI tools and students showed their concerns about the commercial purposes of ChatGPT and AI tools in academic pursuits (M=3.70).

Table 3

Impact of Benefits, Challenges and Ethical Concerns on Usage of ChatGPT and AI Tools for Academic Purposes

Benefits, Challenges, and Ethical Concerns	Unstandardized Coefficients. (UC)		Standardized Coefficients. (SC	t	Sig.	Results
	B	SE	Beta			
Benefits of ChatGPT and AI Tools	.366	.117	.224	3.136	.002	Ho1=Not Accepted
Academic Integrity Concerns	.521	.090	.495	5.815	.000	Ho2: Not Accepted
Regulation Concerns	.274	.118	.212	2.317	.022	Partially
Cognitive Bias Concerns	-.259	.100	-.267	-2.597	.010	
Privacy Concerns Concerns	-.132	.101	-.102	-1.305	.194	Ho2: Accepted Partially
Gender & Diversity Concerns	.096	.122	.080	.783	.435	
Accessibility Concerns	.181	.130	.139	1.389	.167	
Commercialization Concerns	-.032	.126	-.024	-.253	.800	

R=.670, R Square=.449, F=13.65, p =.000

Dependent Variable: Usage of ChatGPT and AI Tools for Academic Purposes

Further analysis was conducted to assess the impact of benefits, challenges and ethical concerns on usage of ChatGPT and AI tools for academic purposes. Results of multiple regression showed that the benefits of ChatGPT and AI Tools significantly impact their usage for academic purposes. As far as challenges and

ethical concerns are concerned, Academic Integrity Concerns, Lack of Regulation and Cognitive Bias also significantly impact the usage of ChatGPT and AI Tools for academic purposes. However, Cognitive Bias has a negative impact on the usage of ChatGPT and AI Tools for academic purposes. Moreover, gender & diversity, accessibility and commercialization do not significantly impact the usage of ChatGPT and AI Tools for academic purposes. Hypothesis Ho1 was not supported by results and was rejected resulting in the significant impact of the benefits of ChatGPT and AI tools on students about their usage for academic purposes. Hypothesis Ho2 was partially rejected as challenges of academic integrity concerns, lack of regulation and cognitive bias significantly impact the usage of ChatGPT.

Discussion

Findings indicated that most university students are using ChatGPT for academic purposes. Additionally, present research found that students are using ChatGPT and AI tools for academic purposes such as generating class assignments, projects, and academic content. A study by Cotton et al. (2023) also highlighted that due to chatbot application access to students, now it is difficult for teachers to differentiate between student's original work and AI-generated work. In this situation, it is difficult for teachers to know about the actual understanding and learning level of students.

Most students agreed on the benefits of AI tools for academic purposes. However, students also indicated concerns about academic integrity regarding the use of AI tools for academic purposes.

Students also indicated their concerns about regulations, information privacy, cognitive biases, gender & diversity, accessibility and commercialization of ChatGPT and AI tools while using them for academic purposes.

Li and Xing (2021) research study also favored the results of present research regarding the befits of AI tools in educational setups. One of the advantages of AI is the language model which serves as an asynchronous interaction platform. Students may collaborate and engage themselves with AI tools. AI tools provide the opportunity to ask questions and talk about various subject areas like human conversation. According to Bin-Nashwan et al. (2023), although AI tools have various benefits, it is also a controversial issue in academia because cheating and academic integrity are serious concerns attached to use of ChatGPT. Academic integrity negatively influences the adoption of ChatGPT behavior. Moreover, they also recommended that there is a need for collaboration between stakeholders such as AI programmers, academic organizations, and publishers to collaboratively decide the ethical guidelines for the use of AI tools in academic pursuits. Farrokhnia et al. (2023) also explained the threats of AI tools such as academic integrity, lack of contextual understanding of topic, democratizing plagiarism, promoting discrimination and decline in cognitive abilities. Present research study is also supported by another study of Tlili et al. (2023) which reported that ChatGPT users are worried about displaying demographic as well as private information such as age, gender, hobbies, personal address to ChatGPT. They are concerned about data security risks, data processing methods and the legality of possession of data due to limited relevant regulations and laws.

Present research also concluded that benefits of ChatGPT and AI Tools significantly impact the frequency of use of AI tools among higher education students for academic purposes. Challenges and ethical concerns such as academic integrity, lack of regulation and cognitive bias pointedly impact the usage of ChatGPT and AI Tools among students for academic purposes. However, cognitive bias can become the cause of the decrease in ChatGPT and AI Tools usage among students for academic purposes. Moreover, gender & diversity, accessibility and commercialization have no impact on the frequency of ChatGPT and AI Tools usage among students for academic purposes. Research study conducted by Cotton et al. (2023) also communicated concerns about the challenges of AI tools such as GPT-3. Access is one of the challenges that can be a cause of unfair advantage to those students who have access to AI for writing high-quality assignments. Farrokhnia et al. (2023) research work also provided evidence about the potential implications of AI tools in the educational environment. ChatGPT can generate answers, provide real-time, personalized responses, facilitate complex learning, offer information access and reduce the workload of faculty. Farrokhnia et al. (2023) also highlighted the weaknesses of AI tools such as lack of in-depth understanding & higher-order reasoning skills, risk of discrimination and bias and difficulty in analyzing outstanding replies. Tlili et al. (2023) conducted a study on three expert university educators who were provided an opportunity to use ChatGPT reported that ChatGPT is susceptible to errors in responses e.g., bias. Garg and Goel (2022) also showed their concerns about ChatGPT regarding cheating, especially during online exams.

Tlili et al. (2023) also said in their research that ChatGPT can be the cause of laziness in students. It may generate responses with errors and fake information.

They also reported that students can face vagueness and inaccuracies in replies to ChatGPT on experience-based topics resulting in lack of trustworthiness of information and doubts. Responses of ChatGPT are without references, which is why it looks like a viewpoint. One of the challenges of ChatGPT is that it may reduce the critical thinking of students.

Conclusion

Present study concluded that university students are using ChatGPT to make class assignments, projects, and academic content. However, students also showed their concerns about academic integrity, regulations, information privacy, cognitive biases, gender & diversity, accessibility and commercialization of ChatGPT and AI tools while using them for academic purposes. In addition, benefits of ChatGPT and AI Tools significantly impact the frequency of use of AI tools among higher education students for academic purposes. Challenges and ethical concerns such as academic integrity, lack of regulation and cognitive bias purposely impact the usage of ChatGPT and AI Tools among students for academic purposes. However, cognitive bias is the cause of the decrease in ChatGPT and AI Tools usage among students for academic purposes. Additionally, gender & diversity, accessibility and commercialization have no impact on the frequency of ChatGPT and AI Tools usage among students for academic purposes.

Recommendations

1. Students may be trained through workshops about the use of ChatGPT and AI Tools for academic purposes.

2. Teachers may provide guidelines in written form while assigning any task/assignment about the uses and confines of ChatGPT and AI Tools for academic purposes.

3. Students may be provided with information about various challenges and ethical concerns attached regarding the use of ChatGPT and AI Tools for academic purposes.

4. Seminars may be arranged for students regarding awareness of the fair use of ChatGPT and AI Tools (e.g., proper citation) for academic purposes.

5. Educational institutions may devise a policy for the use of ChatGPT and AI Tools in academic settings.

6. Future research studies may explore ChatGPT usage among students at the school level with mixed-methods research approach.

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