What ChatGPT means for universities: Perceptions of scholars and students

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Abstract

This study investigates the implications of ChatGPT, an AI-powered language model, for students and universities by examining the perceptions of scholars and students. The responses of seven scholars and 14 PhD students from four countries – Turkey, Sweden, Canada and Australia – are analysed using a thematic content analysis approach. Nine key themes emerge from the findings. According to their frequency of recurrence, these themes are: "Evolution of learning and education systems", "changing role of educators", "impact on assessment and evaluation", "ethical and social considerations", "future of work and employability", "personalized learning", "digital literacy and AI integration", "AI as an extension of the human brain", and "importance of human characteristics". The potential benefits of AI in education as well as the challenges and barriers that may arise from its integration are discussed in the context of existing literature. Based on these findings, suggestions for future research include further exploration of the ethical implications of AI for education, the development of strategies to manage privacy concerns, and the investigation of how educational institutions can best prepare for the integration of AI technologies. The paper concludes by emphasizing the importance of understanding the potential opportunities and challenges associated with AI in higher education and the need for continued research in this area.

Introduction

Recent advancements in artificial intelligence (AI) have led to growing interest in understanding its potential applications and implications across various domains. Developed by OpenAI and released to the public in November 2022, ChatGPT has become widespread at an impressive speed, so much so that it reached one million users in five days. Reaching this number took 300 days for Facebook, 720 days for Twitter and 75 days for Instagram (Biswas, 2023; Fırat, 2023). ChatGPT's wide range of use cases and its potential to improve the productivity of users in almost every industry are inspiring new conversations about this frontier AI application (Xames & Shefa, 2023). Education is among the most talked about. While some consider that this AI's pioneering application will create a paradigm shift in various fields, including education (Bozkurt, 2023; Sallam, 2023), others emphasize the possible ethical challenges of ChatGPT and consider it a disruptive technology (Haque et al., 2023; Sardana et al., 2023). García-Peñalvo (2023) argues that the criticisms of ChatGPT stem from the resistance to change against its innovative and transformative potential rather than the disruptive nature of this technology. Since its public launch, ChatGPT's ability to perform complex tasks in the field of education has caused mixed feelings among educators (Baidoo-Anu & Owusu Ansah, 2023).

The GPT-3 Natural Language Processing (NLP) model had 175 billion parameters, about ten times more than previous language models. GPT-3, an auto-regressive language model, was found to perform strongly on many NLP datasets, such as answering questions and completing missing words in the training process (Brown et al. 2020). While the reverberations of ChatGPT's extraordinary success continued, its successor GPT-4 emerged and started to exhibit numerous new features. GPT-4 is more reliable, more creative, and can handle much more nuanced instructions than GPT-3.5 (OpenAI, 2023). The main differences between GPT-3.5 and GPT-4 are the parameter size of the models (GPT-3.5 has 175 billion parameters while GPT-4 has much more context length, the ability to use images as input in addition to text, and the use of Rule-Based Reward Models in its training (Koubaa, 2023; OpenAI, 2023).

AI technologies, such as ChatGPT powered by GPT-4, have demonstrated significant potential to transform how students learn and interact with information. As these AI-driven tools become increasingly sophisticated and accessible, it is essential to explore their impact on students and educational institutions, particularly universities. This study aims to investigate the perceptions of students and scholars regarding the implications of ChatGPT for students and universities.

The introduction of AI technologies in education has the potential to revolutionize traditional educational practices, promote personalized learning experiences, and foster the development of soft skills (Fırat, 2023). However, the integration of AI in education also raises critical questions about the potential challenges and obstacles that may emerge as a result of this technological shift. The current study addresses these concerns by conducting a thematic content analysis of responses from students and scholars for an open-ended question.

Literature review

Although the use of AI in educational activities is not a novel subject, the rapid proliferation of OpenAI's ChatGPT application has made it a trending topic in the first quarter of 2023. Despite the relatively recent emergence of GPT-4 in everyday use, the related literature has swiftly expanded. The implementation of AI-supported chatbots in universities is garnering attention as a potential solution for enhancing student engagement and learning outcomes. Over the past decades, various studies have investigated the effectiveness of chatbots in diverse educational contexts. In particular, this study focuses on the impacts of ChatGPT on educational processes and the implications of these effects for universities.

The utilization of AI-based chatbots in educational activities represents a significant domain for supporting student engagement and learning processes. Research has demonstrated that chatbot technologies can enhance student interaction and learning processes (D'Mello et al., 2014), enrich learning experiences by impacting student success in higher education (Winkler & Söllner, 2018), and potentially improve student motivation, engagement, and learning outcomes (Deng & Yu, 2023). However, it is not yet possible to assert a consensus among educators, specifically concerning ChatGPT.

Prior to the advent of ChatGPT, a study by Sengupta and Chakraborty (2020) investigated the use of chatbots in higher education and found that they can be an effective tool for improving student engagement and satisfaction. The study also highlighted that chatbots could reduce the workload of university staff by answering frequently asked questions. Similarly, a study by Alotaibi et al. (2020) explored the impact of a chatbot on student learning outcomes in a computer science course. The results showed that using a chatbot significantly improved students' performance and knowledge retention. Furthermore, a study by Xiong et al. (2021) examined students' perceptions towards a chatbot in a language learning setting. The study found that students had a positive attitude towards the chatbot and perceived it as a useful tool for language learning.

Recent developments in language AI, particularly with the advent of GPT-4, have further expanded the potential applications of chatbots in education. Okuyama and Suzuki (2023) proposed a new training methodology for GPT-4 that leverages large-scale semantic discrimination tasks to improve the model's ability to understand the meaning of a text. This could potentially lead to more effective chatbots in educational contexts. Sullivan et al. (2023) found that ChatGPT has raised both academic integrity concerns and the potential for enhanced learning in higher education. Their content analysis of 100 news articles revealed mixed responses, with an emphasis on academic integrity and innovative assessment design. However, the study also noted that the potential benefits for disadvantaged students and students' perspectives remain underrepresented in media discussions.

Other recent studies have explored the opportunities and challenges of using large language models like ChatGPT in education. For example, Kasneci et al. (2023) examined the potential benefits and risks of ChatGPT for education, while Willems (2023) discussed the wider ethical implications of using such models in universities. Malinka et al. (2023) explored the educational impact of ChatGPT and questioned whether artificial intelligence is ready to obtain a university degree. Rudolph et al. (2023) critically looked at ChatGPT and its potential impact on traditional assessments in higher education. Halaweh (2023) focused on the responsible implementation of ChatGPT in education and proposed strategies for ensuring that the technology is used ethically and effectively. Finally, Crawford et al. (2023) argued that leadership is needed to ensure the ethical use of ChatGPT in education, with a particular focus on character, assessment, and learning using artificial intelligence.

In a study that criticizes the use of ChatGPT in education, Thorp (2023) emphasized that this application may be fun but has serious consequences in the world of science and academia. In particular, he emphasized that there are significant concerns about how it will make changes in education and argued that although ChatGPT can write articles on various topics, its academic writing is still developing (Thorp, 2023). This has required academics to rethink their courses with innovative methods and assign assessments that are not easily solved by AI. Baidoo-Anu and Owusu Ansah, (2023) reviewed the potential benefits of ChatGPT in teaching and learning. They found that the advantages of ChatGPT include personalized learning, the encouragement of interactive learning, and the potential for formative assessment that supports teaching and learning and provides continuous feedback. However, ChatGPT has been found to have issues of misinformation generation, bias in data training and privacy issues.

The related literature encompasses studies on the use of AI and, specifically, the GPT-4 model in education. However, as of early April 2023, there is an insufficient number of studies addressing the perspectives of scholars and students on the rapid use of ChatGPT. The findings of this research, conducted during a period when discussions on the use of ChatGPT in universities are intensely occupying the higher education agenda, will make a significant contribution to the existing body of literature.

Method

This study aimed to explore the perspectives of students and educators on the implications of ChatGPT and AI integration in the context of universities. To achieve this, a question was first shared with scholars on ResearchGate, from which responses were received from seven scholars. The same question was then asked in a Google Form for data collection, with answers collected from 14 PhD students. Thus, in total, data were collected from 21 scholars and PhD students in the field of social science. Demographic information of the participants is provided in the Table 1 below.

Table 1. Participant demographic information.

	Field	Country	N
Scholar	Education Strategies	Sweden	1
	Open Distance Learning	Turkey	4
	Developmental Studies	Canada	1
	Medical Education	Australia	1
PhD Students	Open Distance Learning	Turkey	6
	Educational Technology	Turkey	3
	Political Science	Turkey	1
	History	Turkey	1
	Economics	Turkey	2
	Public Administration	Turkey	1

The scholar participants of this study were seven academic staff from four different countries: Turkey, Sweden, Canada and Australia. Four of them were from the open and distance learning field. In terms of PhD students, all participants were from Turkey. Six of the students were from open and distance learning and three from educational technology. Overall, it can be stated that the majority of the participants are from the fields related to education. Nine of the participants were male and 12 were female.

An open-ended question was used to collect data for this study. The question was designed to gather opinions and insights on the potential impact of ChatGPT on students and universities. Participants were encouraged to share their thoughts on the topic, resulting in a collection of diverse responses. The responses were compiled into a single document. All personally identifiable information was removed to maintain the anonymity of the participants. There were 24 comments from 21 participants in the resulting data set. The data was analyzed using thematic content analysis. This allowed for the identification of emerging themes and patterns in the participants' opinions.

Thematic content analysis

Thematic content analysis is a widely used qualitative data analysis method that involves identifying, analyzing, and reporting patterns (themes) within the data (Neuendorf, 2018). In this study, the analysis was conducted in six steps, as provided in Table 2.

Table 2. Thematic content analysis steps.

Steps	Description
Familiarization	The researcher read through the responses multiple times to gain a deep understanding of the data and the perspectives shared by the participants.
Initial coding	The researcher identified and labeled meaningful units of text, such as phrases or sentences, that captured the essence of the participants' opinions.
Searching for themes	The initial codes were then examined to identify patterns and relationships, leading to the development of potential themes
Reviewing themes	The identified themes were reviewed in relation to the coded extracts and the entire dataset to ensure that they accurately represented the data.
Defining and naming themes	The final themes were refined and given descriptive names to reflect their content.
Reporting	The results of the thematic content analysis were presented as a summary of the key findings, with illustrative quotes from the participants' responses to support the identified themes.

Using the thematic content analysis method, the study was able to extract valuable insights and opinions from the collected responses, providing a deeper understanding of the potential implications of Chat GPT and AI integration in the context of students and universities.

Ethical considerations

The COPE (Committee on Publication Ethics) guidelines have been followed in this research. The main ethical considerations in this research were voluntary participation and protection of the participants' privacy and well-being. The participants were informed about the voluntary participation and that they could leave the study at any time. The information that the participants shared with the researchers was not shared with other participants. In addition, participants' names were not used in the text of this article. Finally, collecting the data through online platforms made it possible for the participants to express themselves without exposing their identities.

Findings

Nine themes emerged from the analysis of the comments on the question "What does ChatGPT mean for students and universities?" The main themes identified through the thematic content analysis of the comments and the frequency of each theme are presented in Table 3. The frequencies represent the number of times that a theme was mentioned or discussed in the total number of comments analyzed.

Table 3. Themes, descriptions and frequencies.

Themes	Description of the theme	Frequency
The changing role of educators	Integrating AI, like Chat GPT, in education may shift the role of educators from content providers to facilitators, mentors, and guides who focus on fostering soft skills, critical thinking, and creativity.	13
Personalized learning	Chat GPT and similar AI tools can enable personalized learning experiences by adapting to students' individual needs and learning styles while also removing barriers such as shyness or hesitation to ask questions.	8
Impact on assessment and evaluation	The widespread use of AI in education may require rethinking assessment methods, as traditional exams and assignments may become obsolete due to the ease of obtaining AI-generated answers.	11
Digital literacy and AI integration	The adoption of AI in education highlights the importance of digital literacy, as students need to learn how to interact effectively with and critically evaluate AI-generated content.	7
Ethical and social considerations	The use of AI in education raises ethical and social concerns, including issues of privacy, access, and the potential for increased reliance on technology, which may lead to reduced cognitive capacities.	9
Evolution of learning and education systems	AI may drive significant changes in educational systems, including an increased emphasis on open and distance learning, alternative accreditation methods, and a greater focus on developing human-specific skills.	16
Future of work and employability	The integration of AI in education and the job market may lead to the disappearance of certain job categories and the emergence of new ones, requiring a reevaluation of educational programs and curricula.	9
AI as an extension of the human brain	AI technology is seen as an extension of the human brain, potentially transforming how we learn and interact with information. This new extension will extend the boundaries of learning and education, necessitating a reorganization of educational systems.	3
The importance of human-specific features	With AI becoming more prevalent, curricula in higher education should focus on improving human-specific features such as emotional intelligence, creativity, aesthetic understanding, and philosophical perspectives.	2

The comments of scholars and PhD students reflect the diverse opinions and concerns of the participants regarding integrating Chat GPT and AI into education. Overall, the consensus is that AI will significantly impact traditional learning methods, shifting the focus on skills and competencies and redefining the roles of educational institutions. Participants also recognize the challenges and potential issues that may arise in the process, but they express optimism for the future of AI in education. Here are three direct quotes from the participants:

> Students can more easily adapt their learning to their present level of understanding – and without being shy about a machine (P1).

> Pedagogy will likely tip over from the present dominance of constructivism (to form a good personal understanding of X) to constructionism (to learn how to tinker with X, to construct and apply, take apart and put together again) (P5).

> Self-directed learning will become a lot easier for the skilled and motivated person, but digital literacy is needed, and we will probably see fast development of new systems of accreditation of knowledge, besides having attended university courses (P8).

A bubble graph was created to show the size of the themes according to their frequencies. The sizes of the themes obtained from qualitative data according to their frequencies are given in Figure 1 below.
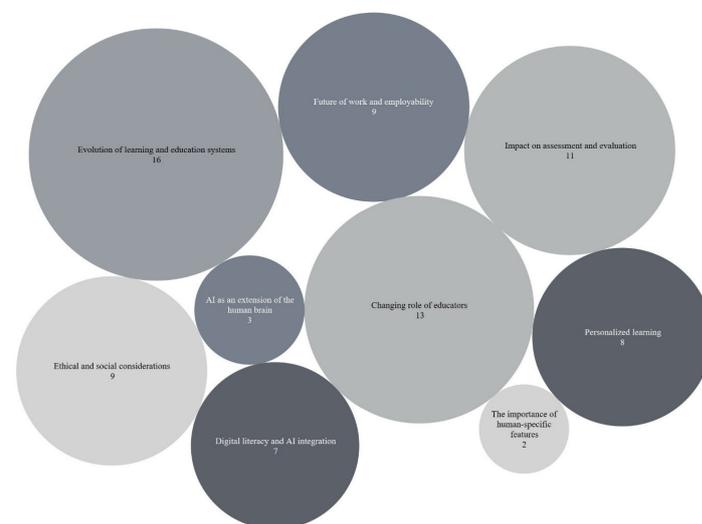

Figure 1. Size of the themes according to their frequencies.

As can be seen in Figure 1, the most repeated themes were "evolution of learning and education systems" with 16 frequencies, "changing role of educators" with 13 frequencies, "impact on assessment and evaluation" with 11 frequencies. These three themes show that scholars and students think that AI technologies will change our habits regarding the implementation and evaluation of education by looking at the capabilities of ChatGPT, one of the leading AI applications.

Discussion and conclusion

The findings from the thematic content analysis are consistent with the existing literature, highlighting the potential benefits and challenges of integrating AI, such as ChatGPT, into education. The changing role of educators, as discussed by Fırat (2023), Bozkurt (2023), and Sengupta and Chakraborty (2020), supports the idea that AI tools can increase student engagement and satisfaction by relieving university staff of routine tasks and allowing them to focus on higher-order skills and mentoring. In a similar vein, Alotaibi et al. (2020) found that chatbots can improve student performance and knowledge retention, which supports the theme of personalized learning found in the analysis of this study.

Recent advancements in AI, such as GPT-3.5 and GPT-4, have further implications for education as these models become increasingly capable of understanding and generating human-like text (Adiguzel et al., 2023). This development supports the theme of "AI as an extension of the human brain" and the potential for transformative changes in the learning process. However, integrating AI in education also raises concerns about assessment and evaluation, as traditional methods may become obsolete in the face of AI-generated answers (Rudolph et al., 2023).

The themes related to digital literacy, ethical and social considerations, and the importance of human-specific features are also evident and strongly emphasized in the related literature. Willems (2023) discussed the ethical implications of using large language models like ChatGPT in universities, while Halaweh (2023) and Crawford et al. (2023) emphasized the need for responsible implementation and leadership to ensure the ethical use of AI in education. Similarly, Baidoo-Anu and Owusu Ansah (2023) highlighted ChatGPT's problems of misinformation generation, bias and privacy, while Thorp (2023) stressed the serious consequences of using ChatGPT in education and science.

In conclusion, integrating AI in education offers numerous opportunities to enhance learning experiences, personalize instruction, and transform the role of educators. However, this shift brings about challenges in assessment, digital literacy, and ethical considerations. To maximize the benefits of AI in education, it is crucial to address these challenges and develop strategies to ensure responsible and equitable implementation. Future research should continue to explore the potential applications and impacts of AI in education, as well as the development of effective frameworks for integrating AI in curricula, assessments, and pedagogy. By fostering a collaborative dialogue between researchers, educators, and policymakers, we can harness the potential of AI to revolutionize the educational landscape while ensuring that the human element remains at the forefront of learning and development.

While the thematic content analysis conducted in this study provided valuable insights into participants' perceptions, future research could benefit from using additional qualitative and quantitative methods to further explore how AI affects the educational process. Longitudinal studies examining the implementation of AI tools such as ChatGPT in educational settings, as well as experimental designs investigating the effectiveness of AI-assisted learning interventions, could provide valuable evidence to guide the development of best practice and policy for the integration of AI in education. For students and universities, this research highlights the transformative potential of AI technologies such as ChatGPT. It also highlights the need to minimize potential risks and unintended consequences, while ensuring that the benefits of AI integration in education are realized through ongoing dialogue and research.

Limitations

Despite the valuable insights provided by this study, there are limitations that must be acknowledged. This research is limited with a sample size of 21 scholars and PhD students and an open-ended question for data collection. Since PhD programmes require an adequate level of English, it was assumed that students and scholars understood the question asked in English correctly. The inclusion of participants from more diverse backgrounds and countries can provide a broader understanding of the implications of ChatGPT and AI integration in universities. Future research could benefit from including scholars and students from a wider range of academic fields to provide a more comprehensive understanding of the implications of AI integration in higher education.

Suggestions

In accordance with the findings of this study, it is possible to offer some significant recommendations to the stakeholders. In the context of AI utilization in education, these stakeholders include educators, policymakers, researchers, technology experts, educational strategists, instructional designers, and administrators. The recommendations are as follows:

- Develop policies, guidelines, and best practices for the ethical and effective use of AI technologies, such as ChatGPT, in education through continuous dialogue and collaboration among all stakeholders.

- Specifically focus on integrating critical thinking, creativity, problem-solving, and digital literacy skills as explicit learning outcomes and experiential competencies within course and curriculum designs. To achieve this, prioritize curricula and pedagogical approaches that better address the capabilities of AI tools.

- Encourage the adoption of AI-supported learning environments that are personalized, adaptive, and responsive to individual learners' needs while promoting self-directed learning.

- Conduct further research, including longitudinal and experimental studies, to gain a better understanding of the long-term effects of AI integration in education and its impact on stakeholders, primarily educators and students.

- Investigate the development of accreditation systems for recognizing and validating knowledge and skills acquired through AI-supported learning.

By implementing these recommendations, all stakeholders can collaboratively harness the potential of AI technologies, such as ChatGPT, to enhance learning experiences and outcomes in higher education while mitigating potential risks and unintended consequences.

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