

Transforming Education with AI: An Exploratory Study of Faculty Insights on ChatGPT's Opportunities and Risks

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Abstract: Objective: This study explores ChatGPT adoption in higher education, highlighting both its benefits and perceived risks. **Method:** This research adopts an exploratory and qualitative approach to deeply analyse instructors' perceptions regarding ChatGPT adoption in higher education. This approach is implemented via semi-structured interviews with 25 faculty members from different nationalities. **Result:** The findings reveal that ChatGPT improves academic performance, research activities, and training, but also raises concerns about technology dependency, ethical implications, and diminished human interaction. **Conclusion:** Faculty members emphasize the need for thoughtful and balanced integration of this technology to maximize its benefits while minimizing its potential risks.

Keywords: ChatGPT, Higher education, Benefits, Perceived risks, AI adoption

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Introduction

The integration of artificial intelligence (AI) in higher education has attracted growing interest, significantly transforming educational practices. AI, defined as the branch of computer science dedicated to creating machines capable of performing tasks usually performed by human intelligence (Russell & Norvig, 2016), has become a powerful tool in education. Technologies such as intelligent tutoring systems and educational content creation platforms have seen increasing adoption in various educational contexts. This trend illustrates a broader effort to optimize learning and make educational processes more efficient and personalized (Karsenti, 2018; Becker, 2018).

ChatGPT, developed by OpenAI, is a language model based on the Generative Pre-trained Transformer (GPT) architecture. Launched in November 2022, it uses reinforcement learning from human feedback (RLHF) to generate more relevant and ethical responses. This advanced model stands out for its ability to interactively engage with users and generate coherent text, offering revolutionary potential for higher education.

The impact of artificial intelligence (AI) in education has been an active topic of research among academics. The exponential growth of ChatGPT, reaching 100 million active users in just two months, raises important questions about its impact in various fields, including education (Sohail et al., 2023). Its potential extends to personalizing learning paths, facilitating the creation of educational materials, and overcoming language barriers (Radford et al., 2019). By enhancing instructors' ability to provide

dynamic and tailored responses, ChatGPT enriches students' educational experience (Adiguzel et al., 2023; Chen, 2023; Zhiyi, 2024) and enables a more immersive and flexible approach to knowledge delivery (Kasneji et al., 2023).

Education marketing has undergone a significant transformation with the advent of artificial intelligence (AI). AI in education refers to the use of techniques and technologies to improve teaching and learning processes. It covers a wide range of applications, such as educational data analysis, learning personalization, virtual tutorials, automated assessment, academic fraud detection, and educational content recommendation (Xu et al., 2021). These technologies enable a more flexible approach tailored to the individual needs of learners, thus contributing to a significant transformation of education (Ouyang et al., 2022).

Despite these concerns, the perceived benefits of AI in higher education are still underexplored, particularly regarding instructors' attitudes towards its use and its impact on teaching practices. To fill this gap, this article proposes to analyse both the perceived benefits and risks related to integrating ChatGPT in higher education. This research adopts a constructivist and inductive approach to explore how instructors perceive this technology and to formulate recommendations for an informed adoption of AI in teaching practices.

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Literature Review

Artificial intelligence in education: Concept and applications

The traditional model of teaching, where the instructor was the main provider of information and the interaction remained one-way, is being challenged by these advances (Bates & Sangrà, 2011). Although this model offers advantages, such as face-to-face interaction and enriching discussions, it limits the learning experience to a passive approach to students. AI now allows for more interactive and dynamic methods, thus improving the overall learning experience (Tucker, 2012).

Thanks to AI, innovative teaching approaches, such as the flipped classroom, have emerged. In this method, classroom roles are reversed: students access educational resources in advance of sessions and use class time to delve deeper into complex concepts. This approach offers greater flexibility, allowing students to progress at their own pace (Bergmann & Sams, 2012). AI plays a key role in facilitating the creation and analysis of interactive content tailored to students' needs, which promotes increased personalization of learning (Hamdan et al., 2013). As a result, knowledge retention is optimized, as students can adjust their learning pace according to their abilities (Davies et al., 2013).

One of the specific applications of AI is adaptive learning, a method that personalizes the learning experience based on each student's performance. Through the analysis of data by algorithms, AI adjusts educational resources according to the specific needs of learners, thus promoting motivation and engagement (Rusilovsky & Peylo, 2003). At the same time, educational chatbots have also emerged as a notable innovation in the field of education. These intelligent agents interact with students, answering their questions and offering them continuous assistance, which helps to better understand concepts (Clarizia et al., 2018; Okonkwo & Ade-Ibijola, 2020). These tools are particularly useful in online learning, offering instant and personalized help throughout the learning journey.

AI-assisted teaching goes a step further by using intelligent systems to monitor student progress and adjust teaching methods in real time. This helps to optimize overall teaching effectiveness and provide a learning experience that is more focused on student needs (UNESCO Document, 2019). Online learning, which is increasingly integrated into educational environments, offers flexibility in terms of time and location, allowing students to choose when and where to study, a crucial factor for those with outside responsibilities such as work or family (Smedley, 2010).

Finally, online learning also promotes interaction between students via forums and other collaborative tools, which strengthens engagement and group dynamics (Wagner et al., 2008). AI plays a key role here by facilitating these interactions and allowing students to better collaborate, thus making learning more interactive and enriching.

This study is based on the Active Learning Theory, which posits that learners construct their knowledge more effectively when they are actively engaged in the learning process (Bonwell & Eison, 1991). In this context, AI acts as a facilitator by providing tools that encourage active engagement, enabling students to participate more actively in their learning rather than being mere passive recipients of information.

Benefits and Risks of Adopting AI: ChatGPT in Higher Education

Benefits of Adopting ChatGPT in Higher Education: The adoption of ChatGPT in higher education represents a significant step forward thanks to the rapid advances in artificial intelligence.

The launch of ChatGPT by OpenAI on November 30, 2022, has opened up exciting new perspectives, although its potential impact on various aspects of education is still undeniably uncertain (Kasneji et al., 2023). In recent years, interest in the application of AI in language teaching and learning has increased significantly, highlighting both the opportunities offered and the challenges, such as exit bias and misuse (Shen et al., 2023). However, when these issues are managed appropriately, they can provide valuable insights for ethically integrating AI into education. Advanced language models like ChatGPT have the potential to transform teaching processes by providing tailored support to students and instructors. Instructors are continually looking to integrate tools that promote student engagement and improve their teaching practices. In this context, ChatGPT proves to be a promising tool that offers a multitude of opportunities for pedagogical improvement.

Table (1): Main benefits of adopting ChatGPT in higher education.

Domain	Benefits
Academic	<ul style="list-style-type: none"> - Accessibility of information: Provides easy access to relevant information and provides detailed answers rather than just a list of sources (Zhai, 2022). - Personalized responses: Learns from interactions with humans and maintains the context of conversations (Shen et al., 2023).
Training	<ul style="list-style-type: none"> - Language translation: Can translate educational materials into different languages, making learning accessible to a wider audience (Baidoo-Anu & Ansah, 2023). - Complex learning facilitation: Provides personalized instructions on complex tasks (Biswas, 2023; Farrokhnia et al., 2023).
Research activity	<ul style="list-style-type: none"> - Research support: Helpful in providing relevant resources and articles based on the research topic (Biswas, 2023). - Task automation: Automating data collection, analysis, and writing, allowing researchers to focus on more creative work (Biswas et al., 2022). - Writing enhancement: Detects and corrects typographical errors, offers sophisticated vocabulary, and suggests improvement strategies (Rahman, 2023).

Table 1 indicates that ChatGPT promotes access to information, supports online learning and training, and facilitates research activity. However, it is crucial to remember that ChatGPT does not replace human interaction and the expertise of instructors and researchers. To maximize the benefits offered by this technology, it should be used as a complement to existing teaching and research methods (Shen et al., 2023).

Risks of Adopting ChatGPT in Higher Education: Although ChatGPT offers many benefits, it also has limitations and potential risks, particularly in terms of reliability and academic integrity. It can sometimes generate inaccurate or biased information, raising concerns about the accuracy of its answers in an educational context. In addition, its use for writing assignments or taking exams raises significant ethical questions, fuelling fears of AI-assisted academic fraud. These concerns have led some institutions to ban access to ChatGPT on their campuses to preserve the quality of learning and academic integrity (Ray, 2023; Chung Kwan Lo, 2023).

Table (2): Risks of adopting ChatGPT in higher education.

Types of risks	Effects on education
Academic	<ul style="list-style-type: none"> - Academic integrity issues: ChatGPT can produce texts similar to those written by humans, thus facilitating plagiarism (Baidoo-Anu & Ansah, 2023). - Overreliance: Overreliance on ChatGPT can lead to neglecting the development of essential skills such as critical thinking and problem solving (Kasneji et al., 2023). - Limited understanding: ChatGPT operates on statistical models and lacks a real understanding of the concepts it teaches (Baidoo-Anu & Ansah, 2023).
Ethics	<ul style="list-style-type: none"> - Discrimination: Some studies show that ChatGPT can perpetuate social stereotypes and unfair discrimination (Zhuo et al., 2023). - Privacy: The use of AI raises privacy concerns, particularly regarding data collection without consent (Baidoo-Anu & Ansah, 2023).
Economic	<ul style="list-style-type: none"> - Job loss: Automation of educational tasks by ChatGPT could threaten some jobs in the education sector (Gill and Kaur, 2023). - Increased inequalities: Unequal access to ChatGPT could widen the gap in academic achievement between students who have access to this technology and those who do not (Poulingue, 2023).
Social	<ul style="list-style-type: none"> - Passive learning: The use of AI can lead students to become passive learners, affecting their ability to develop analytical skills (van der Meij et al., 2022).

Table 2 highlights that integrating ChatGPT into higher education carries significant risks to academic integrity, equity, and privacy. These issues compromise not only the quality of teaching, but also the overall effectiveness of the learning process.

Methodology

Research design

This research adopts an exploratory and qualitative approach to deeply analyse instructors' perceptions regarding the adoption of ChatGPT in higher education. The main objective is to understand the perceived benefits, associated risks, and future expectations of this technology in the academic and research field. This study follows a constructivist paradigm based on an inductive approach., this study aims to capture instructors' experiences and perspectives to identify factors influencing their adoption of ChatGPT, considering academic, pedagogical, and research aspects. This research design is guided by the desire to explore these dimensions through semi-structured interviews, allowing for rich and nuanced data collection on the topic.

Maintenance guide

The interview guide (see Appendix 1) was developed to explore three themes relevant to our research, adhering to ethical guidelines approved by the organizing committee of the 3rd International Conference of FSEG Nabeul. Before data collection, participants were fully informed about the study's purpose and their right to withdraw at any time without consequences.

These themes were carefully chosen to systematically examine different dimensions of the research problem while ensuring participant confidentiality through a coding system. The first theme focuses on potential benefits, addressing the underexplored areas highlighted in our problem statement. The second theme investigates perceived risks, offering a balanced perspective. Lastly, the third theme explores future expectations, providing a deeper understanding of instructors' attitudes toward this technology.

Throughout the study, participants' anonymity was safeguarded, with no personal information collected, and their responses were coded for analysis and citation purposes. The study aims to assess the perceived benefits and risks of integrating ChatGPT into higher education, guided by these themes and in compliance with established research ethics protocols.

The study aims to analyse both the perceived benefits and risks of integrating ChatGPT into higher education through these themes:

- 1. The benefits of integrating artificial intelligence, including ChatGPT, into higher education:** This theme focuses on academic aspects, such as improving the quality of teaching, new pedagogical approaches, interactivity, instructor training, as well as student learning, skills acquisition and creativity development. It also includes potential benefits for research, including writing projects, scientific articles and research dissertations.
- 2. Perceptions of risks associated with the adoption of artificial intelligence, specifically ChatGPT, in higher education:** This theme explores instructors' concerns including increased reliance on technology, fears about the generated information reliability, challenges related to data protection and security, and potential impacts on traditional learning methods.
- 3. Instructors' expectations regarding artificial intelligence, more precisely ChatGPT, in a future perspective:** This last theme addresses instructors' aspirations regarding the future development of ChatGPT and its potential role in optimizing educational practices and improving learning processes.

The development of our interview questions was based on two foundations. First, we conducted a comprehensive review of recent literature on AI in education, with a particular focus on studies examining the implementation of ChatGPT in higher education (Chen, 2023; Kasneji et al., 2023; Shen et al., 2023). Second, we identified the most significant gaps in existing research, including the limited exploration of faculty views on the benefits and risks of ChatGPT adoption. Based on this information, we developed open-ended questions organized around three main themes that directly address our research objective of understanding faculty perceptions of ChatGPT integration in higher education.

These themes were integrated into the interview guide in the form of open-ended questions and prompts to encourage participants to express themselves freely and provide detailed responses on each topic discussed.

Interviews

Semi-structured interviews were conducted with 25 instructors from various fields of specialization in higher education. These interviews were conducted as part of the 3rd edition of the FSEG Nabeul faculty's international conference, in collaboration held on April 18 and 19, 2024 in Hammamet, Tunisia. The participants included 10 Tunisian instructors and 15 foreign instructors (6 French, 3 Canadian, 2 American, 2 Moroccan and 2 Algerian). Participants were selected based on several key variables to ensure more representativeness: gender, age, experience, specialty, and institution of affiliation. These criteria made it possible to target instructors with varied expertise in educational technologies, including artificial intelligence (AI). Interviews were conducted face-to-face to maximize the richness of the exchanges and promote direct interaction, thus providing a deeper understanding of instructors'

perceptions and experiences with the adoption of AI in their learning practices.

To ensure ethical rigor, participants' anonymity was guaranteed, and consent was obtained prior to recording. In addition, external expert reviewers were consulted to validate the interview protocol and reduce potential biases during data collection and analysis.

To ensure the richness of the data collected, the four basic principles developed by Rispoli (2002) were respected:

- *Encourage participants to express themselves freely without limiting their responses to direct questions.*
- *Allow people to pause to think and structure their responses.*
- *Reactivate the conversation to explore topics already discussed in more depth or to restart discussions after prolonged periods of silence.*
- *Maintain active listening by refraining from guiding responses or influencing participants' opinions.*
- Each interview lasted approximately 30 minutes and was recorded with a digital recorder, after obtaining consent from the interviewees. Memo notes were also taken to capture additional impressions and observations. The interviews were structured into three sections corresponding to the identified themes, allowing instructors to freely share their perceptions on ChatGPT.

interviews' analysis

To analyse the collected data, a thematic analysis was chosen using the computer-assisted qualitative analysis software, QSR NVivo (version 12). After transcribing and translating the interviews, relevant text segments were identified and coded. The coding approach allowed for grouping similar information and identifying recurring patterns that explain instructors' perceptions and attitudes toward the adoption of ChatGPT.

The analysis took place in several stages:

- **Data transcription and translation:** The interviews were transcribed verbatim and translated for more accurate analysis.
- **Data coding:** Relevant text segments were coded and organized into thematic categories.

- **Interpretation of themes:** Emerging themes were examined to draw conclusions about instructors' perceived benefits, risks, and expectations regarding ChatGPT.

The author constantly compared the text segments to the original data to ensure that the analysis respected the context and original meaning of the participants' responses.

To ensure the trustworthiness of our analysis, we employed a triangulation strategy (Lincoln & Guba, 1985) at two levels. Methodological triangulation was achieved by combining interview data with observational memo notes taken during interviews, capturing non-verbal cues and immediate reflections. Data source triangulation was attained through the diversity of participant profiles (25 faculty members from different nationalities, specialties, and gender), enabling cross-verification of identified themes. This systematic triangulation approach strengthens the reliability and representativeness of our findings regarding faculty experiences and perceptions.

Results

In this study, we present a detailed analysis of the results obtained from the semi-structured interviews conducted. The objective of these interviews was to understand in depth the participants' perceptions regarding the benefits, perceived risks, and expectations associated with ChatGPT adoption in the higher education field.

Our approach consisted of systematically exploring how participants articulated their opinions and experiences regarding the use of ChatGPT. For greater analytical clarity, we adopted an approach of identifying and categorizing the data into themes and sub-themes, in line with the methodologies recommended in exploratory qualitative studies. This structuring not only allows us to capture the richness and diversity of participants' discourses, but also to identify the main axes of reflection that emerge around this technology adoption.

Our coding process moved from initial data analysis to categories related to the research objective, resulting in the hierarchical structure presented in Figure 1. This figure summarizes our systematic coding process, showing how first-order codes were broken down into subthemes and then aggregated into main themes, providing a comprehensive framework of teachers' perceptions of ChatGPT adoption.

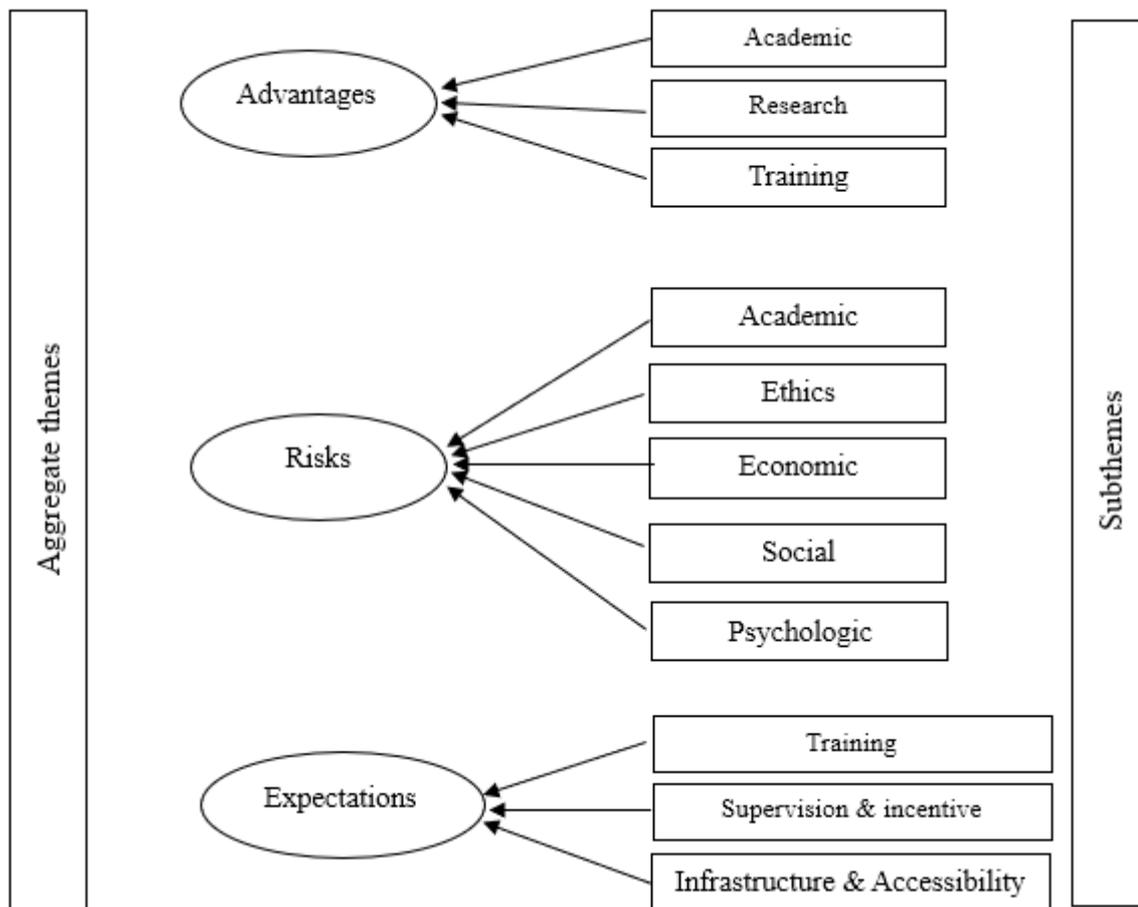


Figure (1): Aggregated themes and sub-themes.

Benefits of integrating ChatGPT into higher education

Academic component: During interviews with instructors regarding the benefits of adopting ChatGPT, several subthemes emerged. A major subtheme identified is the academic dimension, where instructors explained that ChatGPT helped them simplify their work. By providing suggestions to improve the structure and clarity of their lessons, this tool enhances their learning effectiveness. In addition, it allows them to stay informed about new learning methods, which increases their competence and relevance in the field.

Evidence: Verbatim texts from respondents

- “ChatGPT helps me create personalized training for my students, tailored to their specific needs.” (E1)
- “It greatly simplifies my daily work by allowing me to optimize the preparation of my lessons.” (E5)
- “The suggestions offered by ChatGPT significantly improve the structure and clarity of my course presentations.” (E10)
- “Thanks to this tool, I feel more and more competent and in tune with the latest educational innovations.” (E11)
- “It allows me to stay constantly informed about new learning methods and developments in my field.” (E3)

Research component: ChatGPT also plays a significant role in research activities. By facilitating access to relevant information and resources, it is a valuable tool for instructors, speeding up data collection and analysis. This can increase efficiency in producing quality academic content and conducting research projects.

Evidence: Verbatim texts from respondents

- “ChatGPT is able to generate coherent and relevant texts, which facilitates my scientific writing efforts.” (E7)
- “It helps me produce reports, research papers and develop new ideas efficiently.” (E15)
- “The tool is particularly useful for summarizing complex and voluminous works, thus making information gathering faster.” (E12)

Training component: On the training front, instructors reported that the tool helps them develop richer and more interactive course materials, thereby improving the students’ learning experience. ChatGPT’s features, such as generating ideas for learning activities, help strengthen instructors’ skills and keep them informed about advances in learning and pedagogy.

Evidence: Verbatim texts from respondents

- “ChatGPT quickly identifies grammatical and spelling errors in my course materials, improving their quality.” (E20)
- “It also plays a crucial role in language learning by providing accurate translations and suggestions for improvement.” (E8)

Overall, the results show that the subtheme associated with the academic dimension is predominant, representing 71.25% of the total responses collected. This indicates a significant

adoption of ChatGPT in educational activities, strengthening the effectiveness and relevance of instructors' educational practices.

The research activity subtopic ranks second, with 25% of the responses. Instructors use ChatGPT as a strategic tool to improve their research processes, from collecting information to writing research papers.

Finally, although slightly less dominant, the training component represents 21.25% of the responses. ChatGPT proves to be an important tool in the development of interactive course materials and in the continuous improvement of instructors' learning skills.

Perceived risks associated with integrating ChatGPT into higher education

Our research reveals several risks associated with ChatGPT integration in higher education, each with significant implications. The main concern, expressed by a considerable number of instructors, is in the academic field. Participants noted that the use of this tool can lead to an increase in the cognitive load of students, hindering their ability to interact meaningfully with their instructors and promoting a passive attitude. In addition, the information obsolescence provided by ChatGPT, which is limited to data available up to 2021, raises concerns about its relevance and reliability.

Academic risk: Instructors are concerned about the impact of ChatGPT on students' creativity and critical thinking. Verbatim quotes illustrate these concerns:

- *“Adopting ChatGPT can reduce students' mental effort and ability to think critically.” (E1)*
- *“Automated lessons by ChatGPT could make students passive.” (E7)*
- *“We don't control the sources of information, which raises concerns.” (E10)*
- *“Overuse of this tool risks destroying students' abilities to search for information on their own.” (E19)*

Economic Risk: Economic concerns also emerge, particularly regarding the accessibility of ChatGPT:

- *“If the use of these AI models becomes chargeable, it could lead to high costs for education, limiting access for many students.” (E1)*
- *“ChatGPT will not be able to meet the needs of everyone, especially those who do not have access to electricity or a stable internet connection.” (E16)*
- *“This could worsen inequalities in education.” (E9)*

Ethical Risk: Instructors express ethical concerns, particularly regarding academic integrity:

- *“Inappropriate use of data and academic fraud are major risks.” (E11)*
- *“Overuse of ChatGPT could lead to a dehumanization of learning, where students' responses appear standardized.” (E12)*
- *“Sometimes results refer to non-existent journals.” (E19)*

Psychological risk: On a psychological level, concerns remain about the impact of AI on instructors' trust and perception of their role:

- *“This creates a lack of confidence in instructors' abilities.” (E4)*
- *“Instructors' skills can be devalued by technology.” (E11)*

Social risk: Finally, social concerns arise, particularly regarding human interaction:

- *“Over-reliance on AI could lead to social isolation and decreased communication in the classroom.” (E1)*
- *“There is a risk of losing authentic human interaction in the learning process.” (E13)*

Overall, our results highlight that the academic domain accounts for 46% of the concerns expressed by instructors. This indicates a common perception that the use of ChatGPT can harm students' creativity and critical thinking. The ethical component follows with 30%, highlighting fears about academic fraud and learning dehumanization.

Psychological concerns also represent a major obstacle, while social and economic aspects complete the picture, highlighting potential inequalities and impacts on interpersonal relationships.

Instructors' expectations regarding ChatGPT's adoption in higher education

One of the objectives of our research is to understand instructors' expectations regarding the adoption of ChatGPT in the field of education. The results reveal that instructors' expectations focus on three main points. First, they want to benefit from regular training on technological developments to master the new tools. One participant emphasizes: “...It is essential that instructors receive regular training on technological developments to understand how to use these new tools.” (E12). Another adds: “I think we really need practical workshops so that we can get familiar with these tools.” (E3).

Next, instructors express the desire to promote students' acceptance of ChatGPT, by encouraging its use as a learning support tool. For example, one instructor states: “I expect instructors to motivate students to use ChatGPT as a support tool...” (E4), while another mentions: “I expect instructors to explain to students that the use of ChatGPT reflects the evolution of education, which can motivate them to engage more in their learning.” (E16).

Finally, instructors emphasize the importance of infrastructure and technological accessibility. One participant states, “It is therefore incumbent upon educational institutions to put in place the means necessary to ensure that all students have access to this technology.” (E9). Another notes, “If the infrastructure is not there, even the best training will not be effective.” (E14). These expectations underscore the need for an integrated approach to maximize the benefits of ChatGPT in higher education, ensuring that instructors are adequately trained, students are encouraged to use the tool, and that the technological infrastructure is adequate.

Research Result's Discussion

The rapid advancement of artificial intelligence in education and the increasing integration of artificial intelligence tools, such as ChatGPT, raise many questions. Our main objective in this research is to deepen the understanding of educators' perceptions of the benefits, risks, and future expectations related to ChatGPT adoption in higher education. According to a key observation by Hasanein and Sobaih (2023), there is a notable divergence in stakeholder perceptions: while students primarily focus on the tool's benefits, faculty members acknowledge both benefits and risks, whereas education experts express more concerns about potential negative consequences.

The results reveal that instructors consider ChatGPT beneficial on several levels, including academic, learning process, research, and training. These findings align with previous work on three distinct levels. On the academic level,

studies such as Zhai (2022) and Shen et al. (2023) highlight that ChatGPT facilitates access to relevant information and provides personalized responses, thereby enhancing students' academic performance. On the training level, researchers such as Baidoo-Anu & Ansah (2023) and Mohammadreza Farrokhnia et al. (2023) show that ChatGPT simplifies the learning of complex concepts, playing a crucial role in developing instructors' pedagogical skills. In the research domain, recent works by Biswas (2023) and Mostafizer Rahman (2023) confirm that ChatGPT contributes significantly to the research process; and this by improving writing and facilitating the exploration of new ideas.

However, while the benefits of ChatGPT are notable, it is crucial to consider the risks associated with its adoption in the field of education. This finding is supported by previous research conducted in various contexts. On the academic and learning side, Kasneci et al. (2023), and Baidoo-Anu & Ansah (2023) reveal that overreliance on this tool, limited understanding of the subjects, and ease of plagiarism can have a negative impact on higher education. Our findings corroborate these studies, as instructors emphasize that the most significant risk lies in the long-term loss of students' creativity and a reduction in their mental efforts.

A major risk associated with the use of ChatGPT lies in the ethical concerns and reliability of the information it generates. Amodoi et al. (2022), as well as Baidoo-Anu & Ansah (2023), have highlighted issues related to user discrimination and data privacy. Our findings support these concerns, with interviewed instructors also noting that ChatGPT could dehumanize the educational process by generating uniform responses. In the healthcare domain, a recent study found that while ChatGPT can provide useful information, it also poses significant risks in terms of data protection and reliability of medical information (Sohail et al., 2023). Furthermore, an in-depth analysis of its capabilities shows that despite its remarkable performance, ChatGPT remains limited in its complex reasoning and contextual understanding, posing challenges for its use in sensitive domains such as higher education and healthcare (Saqib Sohail et al., 2023). These observations highlight the importance of a thoughtful and cautious approach when integrating ChatGPT into educational and professional contexts.

Regarding the economic implications of adopting ChatGPT, Gill et al. (2023) report that this technology could potentially lead to job losses in the education sector, as it is able to operate autonomously. However, our results differ, with interviewed instructors stating that ChatGPT can support their professional practice without replacing human interaction.

Furthermore, our results highlight a major social risk related to ChatGPT adoption. Although this tool can be valuable for instructors in terms of course management and pedagogical innovation, it likely promotes passive learning. Indeed, ChatGPT provides students with all the necessary information, which can reduce classroom interaction between instructors and students, an essential dynamic for students' active engagement in their learning. This observation is in line with the findings of Jatto & Bakare-Fatungase (2023)

Finally, a new concern emerges from the results: the psychological risk associated with the devaluation of instructors' skills. This devaluation can lead to a loss of self-confidence among instructors and diminish the value of face-to-face learning, highlighting the need for a balance between the integration of new technologies and the preservation of the human interaction value in the educational process.

In sum, while integrating ChatGPT into higher education presents significant opportunities, it also comes with risks that

require careful consideration. The results of our study highlight the importance of a thoughtful implementation framework and adequate training to maximize the benefits while minimizing the drawbacks associated with this emerging technology.

Conclusion

In summary, this in-depth study on instructors' perceptions of integrating ChatGPT into higher education reveals significant benefits, ranging from improved academic performance to facilitating research and learning. These findings corroborate those of recent studies (Zhai, 2022; Shen et al., 2023) that highlight the increased access to information and personalization of learning that this tool offers.

However, this exploration has also highlighted various risks associated with the adoption of this emerging technology. Concerns regarding over-reliance on students, ethical issues related to data privacy and dehumanization. Economic, social, and psychological implications for instructors are not to be ignored. These concerns are in line with the findings of previous studies (Baidoo et al., 2023; Kasneci et al., 2023; Baidoo-Anu & Ansah, 2023) that highlight the dangers of unregulated use of ChatGPT in the educational setting. It is therefore imperative to recognize that the integration of this technology is not limited to its tangible benefits; it also raises crucial ethical and social considerations.

ChatGPT adoption in higher education requires a thoughtful approach that balances benefits and challenges. In doing so, it is essential to preserve active student engagement, maintain the value of human learning, and ensure an ethical and balanced use of this disruptive technology. Our study contributes significantly to the understanding of the benefits and risks associated with this adoption, by building on solid theoretical foundations and informing educators' decision-making processes.

The semi-structured interviews conducted as part of our research provided rich data and allowed the emergence of innovative ideas, thus highlighting the relevance of our methodology. We recommend training programs for instructors, to reinforce their familiarity with advanced technologies, while developing guidelines developed by instructors themselves to frame the ethical use of ChatGPT.

To maximize the impact of ChatGPT on student learning, we suggest implementing pedagogical strategies that emphasize its complementary, rather than substitutive, role to traditional learning practices. This will not only enhance the learning experience, but also preserve the essential human interaction in the educational process.

It is important to acknowledge the limitations of our study, which is characterized by a limited generalization of the results to our specific sample, as well as the subjectivity of participants' perceptions. In addition, the qualitative nature of our research does not allow us to precisely quantify the observed effects. These limitations highlight the need for more comprehensive future research, including comparative analyses and longitudinal studies to better understand the evolution of the adoption of this technology.

Furthermore, while our study focused on ChatGPT, it is critical to note that new AI technologies are rapidly emerging and are increasingly being adopted by educators and students in higher education settings around the world. These innovations include tools such as AI content generators, adaptive learning systems, and educational analytics platforms, which provide similar benefits but also raise challenges comparable to those we identified for ChatGPT. Therefore, the recommendations

made in this study are also relevant and applicable to these other exponentially evolving AI technologies.

We suggest that the adoption of these technologies should be guided by sound ethical principles, critical reflection on their pedagogical use, and ongoing instructor training to ensure that they are used in ways that are complementary and beneficial to learning. Future research could adopt a longitudinal approach to examine the temporal dynamics of the evolution of ecological behaviours. Complementing these findings with quantitative studies, such as surveys to gauge broader trends or experimental designs to measure actual impacts, could provide deeper insights. Furthermore, exploring moderating variables such as cultural context and social norms could enrich our understanding of the mechanisms of transforming knowledge into actions. Additionally, investigating strategies or policies for effectively integrating innovative technologies, including ChatGPT, into ecological practices while addressing associated risks would be valuable. Finally, this research opens the way to studies on the role of innovative technologies in waste management. These technological perspectives, coupled with a better understanding of the psychological mechanisms identified in our study, could significantly contribute to the literature on ecological transition and behavioural change.

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