Journal of Education and e-Learning Research
Vol. 12, No. 2, 153-164, 2025
ISSN(E) 2410-9991 / ISSN(P) 2518-0169
DOI: 10.20448/jeelr.v12i2.6746

ChatGPT in higher education: Opportunities, challenges, and required competencies in the absence of guiding policies

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Abstract

This study examines the opportunities and challenges of employing ChatGPT in higher education, identifies essential user competencies, and evaluates its impact in the absence of formal policy guidelines. A qualitative case study design involved interviews with 10 faculty members and 10 students at a federal university in the United Arab Emirates. Documentation of live ChatGPT usage was also analyzed to triangulate findings. Thematic analysis revealed the following eight core themes: (1) Cost-effectiveness and time savings. (2) ChatGPT as a source of information and a flexible tool. (3) ChatGPT's ability to adapt to the user. (4) Prompt engineering competencies in ChatGPT. (5) Addiction to ChatGPT. (6) The misinformation risks with ChatGPT. (7) Academic integrity concerns. (8) A lack of consensus on how to utilize ChatGPT appropriately. The findings underscore an urgent need for formal policies to guide the ethical and responsible use of ChatGPT in higher education. The study also emphasizes the necessity of targeted training workshops for teachers, curriculum integration, and adapting pedagogical approaches. It also calls for proactive attention to ethical concerns including misinformation, algorithmic bias, and overreliance to ensure that the educational benefits of ChatGPT are realized responsibly and sustainably.

Keywords: Academic integrity, Artificial intelligence, AI challenges, AI integration, AI opportunities, AI regulation, ChatGPT, ChatGPT risks, Higher education, Qualitative case study, Required competencies.

Citation | Alkaabi, A., Abdallah, A., Alblooshi, S., Alomari, F., & Alneaimi, S. (2025). ChatGPT in higher education: Opportunities, challenges, and required competencies in the absence of guiding policies. *Journal of Education and E-Learning Research, 12*(2), 153–164. 10.20448/jeelr.v12i2.6746
History:
Received: 22 January 2025
Revised: 21 April 2025
Accepted: 9 May 2025
Published: 5 June 2025

Publisher: Asian Online Journal Publishing Group

Funding: This research is supported by United Arab Emirates University, United Arab Emirates (Grant number: G00004461).
Institutional Review Board Statement: The Ethical Committee of the United Arab Emirates University, United Arab Emirates has granted approval for this study on 26 March 2023 (Ref. No. ERSC_2023_3099).
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

Contents

Contribution of this paper to the literature
This study is among the first to qualitatively examine ChatGPT's integration within higher education as it addresses the gap in understanding its opportunities, challenges and required competencies. It incorporates student and faculty perspectives and analyzes real-time usage to inform ethical AI integration.

1. Introduction

Modern life routinely revolves around artificial intelligence (AI), particularly ChatGPT (Chui, Manyika, & Miremadi, 2018). Every few weeks, new versions of ChatGPT are released and integrated into everyday technology, including cell phones, smart speakers, laptops, drones (e.g., choreographies), and robotic vacuum cleaners. On many smart devices, including wearable technology, voice assistants, such as Google Gemini and Amazon Alexa and incorporate AI (Chatterjee & Dethlefs, 2023). For some individuals, adapting to rapid technological changes can feel overwhelming. Users of these products quickly become accustomed to offloading their tasks to artificial intelligence and once that becomes an established pattern, controlling its usage becomes a challenge. This can be especially problematic in personal communication among people, such as in the overuse of AI-suggested email or text messages, which can potentially diminish authenticity and human connection.

In a positive perspective, artificial intelligence can be highly beneficial in natural language processing (NLP). Many critical issues across industries, such as health-related challenges (Mustafa, Safi, Opoku, & Mohamed, 2022) and innovative approaches to teaching and learning (Moustafa, Opoku, & Belbase, 2022) could benefit from the support and application of emerging technologies like GPT. Natural language processors built into language models are effective as conversational agents (Abdallah, Alkaabi, Mehiar, & Aradat, 2024). AI is becoming increasingly valuable as it advances and expands into new frontiers. Another major area of benefit is in the field of education where it can be effective at engaging students in the learning process by rapidly generating customized materials for each individual. It also has a significant capacity to tailor instructions to the diverse aptitudes and learning styles of classroom students. Research by Dashly (2023) projected the chatbots market to rise to 10.5 billion USD by 2026. It has become clear that the artificial intelligence sector will vastly surpass such estimates. As a result, universities and schools are placing greater emphasis on continuously adapting to meet the demands of the technological era (Khalil et al., 2023; Qablan & Al-Qaderi, 2009).

The ability of chatbots to respond quickly and accurately greatly increases customer satisfaction. Teachers and students appreciate this benefit in handling numerous questions with minimal human involvement. In comparison to hiring a personal tutor, this option can be very cost-effective and optimize the use of institutional resources (Karyotaki, Drigas, & Skianis, 2022). In education, the release of ChatGPT in November 2022 was a major turning point as far as tools and methods of learning are concerned. ChatGPT has gained enormous popularity and drawn the interest of countless scholars. According to Wang, Zhou, Yang, and Chen (2023), when raised with sophisticated queries, the system's performance seems to leave a gap. This is particularly striking in the hallucination phenomenon where entirely fictitious information is given at random. ChatGPT is extremely advanced, functioning on an incredible 150 billion parameters despite its mistakes (Dowling & Lucey, 2023).This still-emerging technology quickly surpasses conventional educational resources since it can learn through reinforcement with and without human supervision. Such rapid growth has resulted in the absence of AI regulation in education.

Researching the factors concerning the engagement of ChatGPT with students in colleges and universities reveals many interesting aspects. In particular, some studies focus on its effectiveness in language understanding and usability while posing ethical questions about its use. Moreover, different areas of the world have varied interests and priorities regarding LLMs. The UAE has put immense effort into harnessing ChatGPT in a way that maximally enhances student achievement. Other studies also explore how students and teachers perceive the ethical dilemmas associated with chatbot use in educational settings (Farhi et al., 2023).

Farhi et al. (2023) found significant disparities between the views of students and teachers. Many critical ethical concerns were weighted toward teachers while students were somewhat less worried but not unaware of the potential for misuse of chatbots.

This study seeks to address the clear need for governing regulations that balance the benefits and challenges presented by LLMs like ChatGPT. Administrators and teaching faculty are left with little to go on when developing curriculum and standards at their institutions without specific and well-informed guidelines on the most efficacious use of LLMs in education. The present research investigates ChatGPT's influence on one of the largest federal universities in the United Arab Emirates to understand its impact on higher education institutions. The findings can inform future policy decisions and practices within other universities in the UAE, and even globally. This study is timely and relevant with the rapid spread of ChatGPT and usage booming among both teachers and students. This study looks at the issue from university teachers and students' perceptions of their ChatGPT usage to unravel the complexities of beneficial use and healthy regulation of chatbot usage in higher education institutions. It includes a special focus on the advantages and disadvantages of using ChatGPT in an educational context, necessary competencies for its practical use, and how this technology can affect higher education institutions in the absence of formal policies.

2. Literature Review

2.1. Theoretical Background: Leveraging ChatGPT in Educational Contexts

ChatGPT, the advanced language model created by OpenAI has sparked considerable debate regarding its transformative potential to transform our interactions with technology. Many academics and professionals have argued that ChatGPT is certain to become as common a tool for daily writing and professional activities as the calculator is in mathematics. Sharples (2022) recommended that teachers and students embrace AI technologies rather than discount them entirely. The following discussion delves into the opportunities ChatGPT provides in the context of education and weighs them against the disadvantages experienced by teachers and students from K–12 to doctoral levels. Rahman and Watanobe (2023) found that one marked feature of ChatGPT was its ability to

understand spoken language with perfect fluency. They particularly noted its capability as a teacher that could answer questions and disseminate information in seconds. ChatGPT was developed to aid users with complex tasks and inquiries and true to its intention, it has shown significant value in scholarly research and writing. It can generate conceptual foundations for further academic development. It occasionally generated generic or repetitive responses. Researchers such as Kasneci et al. (2023); Kung et al. (2023); Manohar and Prasad (2023) and Transformer and Zhavoronkov (2022) have found it to be a powerful writing assistant.

Just as ChatGPT has presented fresh opportunities within academia, it has also presented several challenges. One salient comparison is the introduction of the internet with its subsequent online study aids like Wikipedia and the Google search engine. ChatGPT and other significant language models in education, such as the advantages and disadvantages of the internet are being challenged. Some scholars such as Selber (2023) have opined that AI tools within higher education should not be adopted with fear but with a pragmatic view of their integration and safe usage. Other studies have taken a similar stance. For instance, a study conducted by Noy and Zhang (2023) discovered an increase in students' confidence in their ability to handle complex tasks, such as essay writing. However, Zhai (2022) found that essay composition moved at a much faster pace and cognitive load was significantly reduced with ChatGPT usage. Ultimately, the observed boost in student productivity was not strongly correlated with internal cognitive gains.

ChatGPT's advantages extend beyond helping students with specific academic tasks and include facilitating classroom discussion and other social engagements. Guo, Zhong, Li, and Chu (2023) conducted a pre-post-test analysis and found that students who used ChatGPT during class discussions had better prepared their arguments and presented them in a more cohesive manner. The researchers observed a great deal more enthusiasm in the discussions compared to traditional formats although there was no remarkable change in the level of sophistication of the arguments presented.

Apart from classroom applications, teachers have particularly noted many features of ChatGPT that pertain to teaching-related activities. For instance, it can create or recommend lesson materials, lesson plans, curricula , and even perform assessment analyses (Farrokhnia, Banihashem, Noroozi, & Wals, 2024; Lo, 2023; Zhai, 2022). Karaman and Goksu (2024) reported a five-week experiment in an elementary school where ChatGPT significantly boosted mathematics performance during portions of the curriculum. Other data collected also suggested that ChatGPT boosted performance in other subjects as well. Abdallah et al. (2024) pointed out that ChatGPT can tailor lessons on troubling concepts by prompting for clarifications and supplying additional resources matched to the students' requirements, thereby functioning as a personal tutor. This feature is useful for large classes where individualized teaching is challenging. The LLM can accommodate many different learners including those who learn through seeing as its supports include charts and diagrams or through reading and writing as in the case of written explanations (Lin, 2023; Qadir, 2023; Singh, 2023). According to a study by Limo et al. (2023) undergraduate students were surveyed regarding their interactions and engagement with ChatGPT. Analysis of the results from that survey indicates that out of the 247 students surveyed, close to 70% admitted to using ChatGPT as a tailored learning assistant. This number speaks to the ever-increasing role of ChatGPT in enhancing learning experiences for students.

2.2. Essential Competencies for Effectively Utilizing ChatGPT

The scope of required understanding goes beyond digital literacy for learners and teachers to tap into the numerous advantages of advanced technologies like ChatGPT. It necessitates wisdom and the combination of manual skills along with skilled prompt crafting for chatbot assistance. Moreover, there is a need to actively ascertain the truth from the information found both within ChatGPT's responses and beyond (Vuorikari, Kluzer, & Punie, 2022). The ability to think critically is fundamental and enables users to make sense of AI-generated information. Teachers and learners need to evaluate the information generated by ChatGPT (Agarwal, Agarwal, & Gupta, 2022; Kalla, Smith, Samaah, & Kuraku, 2023; Tlili et al., 2023) since its responses are primarily grounded in patterns in data not human reason. Thus, prompt ingenuity becomes particularly important in the quest to enhance the integration of human critical thinking with AI's still-developing simulation of neural processes.

Prompt engineering is a developing branch of artificial intelligence that focuses on writing specific prompts to elicit accurate responses from ChatGPT. This discipline is fundamental for optimizing the effectiveness of a large language model as it intersects with the given user input and system output (Liu et al., 2023). A poorly written prompt will most likely return outputs that are either unanticipated or inaccurate relative to the search intent. Unlike a crafted prompt, which may significantly boost outcome relevance and quality, a poorly phrased one will yield mediocre results. The ability to generate a wide variety of content with minimal effort demonstrates the efficacy of the AI's functional design. Ekin (2023) identifies clarity, specificity, context, tone, and brevity as essential characteristics of a well-crafted prompt. Despite the growing body of research that has addressed AI-related competencies, such as prompt engineering in the education system (Fernández-Batanero, Montenegro-Rueda, Fernández-Cerero, & García-Martínez, 2022; Pozo-Sánchez, López-Belmonte, Rodríguez-García, & López-Núñez, 2020) there remains a gap in literature focusing on defining the skills and competencies needed to interact with ChatGPT in higher education.

A study by Tlili et al. (2023) stands out how new skills and cognitive strategies could be developed to unlock ChatGPT's potential user experience in education. Their findings showed that the productivity of ChatGPT output was largely influenced by the structure of the formulated questions. Users needed to understand its basic functionalities to optimally use and improve its capabilities. According to Giray (2023) the ability to learn prompt engineering skills provided academic practitioners with advanced tools that drastically increased their productivity when using large language models. The sustained advancement and development of ChatGPT and AI tools has made them indispensable for academic writing. Additionally, the sharpening of skills in prompt engineering is critical in staying relevant in the increasingly competitive world of research and publication.

2.3. Challenges, Limitations, and Risks of ChatGPT

Several issues should be carefully considered despite the significant learning potential that ChatGPT offers. One consequential concern is that students could rely on ChatGPT, particularly as they note the time savings and

improvement in grades. This can become an addictive cycle and may erode their capability for critical thinking. Other problems include cheating on assignments and tests, excessive reliance, and a noticeable deterioration in writing and critical thinking abilities resulting from students using ChatGPT continuously (Kasneci et al., 2023). Kamoun, Ayeb, Jabri, Sifi, and Iqbal (2023) supported this finding in a study that involved 855 university students and 145 teaching faculty members who worried that ChatGPT would diminish students' intellectual development and academic integrity. For example, students who rely heavily on ChatGPT for their coursework forfeit independent thought and innovative problem-solving. Students often prefer AI-generated solutions to their own sometimes flawed conclusions, and it becomes too easy to defer to its answers rather than improving their reasoning. Moreover, while ChatGPT can aid in writing assignments, overdependence on it might suppress original ideas and diminish their writing competence and ability to articulate themselves effectively (Farhi et al., 2023).

Another major challenge ChatGPT poses is in the dissemination of information. The New York Times identified ChatGPT as the most powerful tool for spreading false information (Hsu & Thompson, 2023). In a series of tests, ChatGPT fabricated narratives for 80 out of 100 contentious issues which highlighted the susceptibility of the large language model to misinform (Brewster, Arvanitis, & Sadeghi, 2023). Even after safeguards and precautionary measures, such as systems designed to prevent misinformation or disclaimers, these efforts all too often prove insufficient to deter malicious actors. The operational mechanics of ChatGPT, particularly its programming to predict the next word in a sequence (Hariri, 2023) are a limited processing method that can easily create errors in mathematics, science , and other contexts (Brumfiel, 2023; Von Hippel, 2023). There is a need for verification of the accuracy of ChatGPT responses and expansion of its foundational mechanisms. Moreover, scholars of ChatGPT have reported cases where ChatGPT created entire reference lists that seemed very credible but were entirely made up (Zhan, Xu, & Sarkadi, 2023).

In addition to misinformation, recent studies have underscored the high stakes risks associated with overdependence on ChatGPT (Baidoo-Anu & Ansah, 2023; Hariri, 2023; Meyer et al., 2023; Tlili et al., 2023; Zhan et al., 2023). Park, Schoenegger, and Zhu (2023) conducted 14 psychological experiments from the many labs 2 project using OpenAI's text-davinci-003 model (GPT-3.5) with the intent to gauge its reliability and accuracy. There was a notable imbalance in the diversity of perspectives. Other researchers, namely Bang et al. (2023) reported that ChatGPT was only 63.41% accurate across 10 categories of reasoning. These categories included logic, non-textual manipulation of data, and common-sense reasoning. The range of areas tested further highlights the unreliability of the large language model. Luo, Puett, and Smith (2023) discovered that bias in language was also deeply rooted in ChatGPT as English was the primary language of the material used in training it. Tlili et al. (2023) underscored the inequity in ChatGPT's access to high-quality learning resources across various cultures and languages. They further stressed the need to protect users' privacy, especially young students who unwittingly divulge sensitive personal information.

One of the most grievous concerns with using ChatGPT, particularly in higher education is its potential to facilitate plagiarism and cheating which causes significant damage to academic integrity. For example, ChatGPT can adopt the voice of another student or author's writing and produces text that is strikingly similar. However, this defeats the purpose of written assignments because it simply produces results in output, but not in students' internal development of critical thinking skills. Stanford University conducted a poll of 4,000 students regarding ChatGPT usage for assignments and 5% (or 200) of them openly admitted to submitting homework entirely generated by ChatGPT without making a single revision to its answer (Cu & Hochman, 2023). The ease of creating unoriginal content continues to trouble teachers (Zhang & Tur, 2024). In interviews with faculty at a private Pakistani institution, Iqbal, Ahmed, and Azhar (2022) identified plagiarism and cheating as primary concerns regarding ChatGPT's integration into classrooms. These trends compelled several K–12 school districts to act. For instance, New York City Public Schools banned ChatGPT on its devices and networks (Goulding, 2023).

ChatGPT has also been exploited beyond academic settings. For example, CNET, a prominent technology website, published over seventy articles generated entirely by artificial intelligence without disclosing their origin. Subsequently, 41 of the 77 articles were found to contain inaccuracies (Sato & Roth, 2023). Using ChatGPT raises ethical considerations that have sparked heated debate within scholarly communities. Critical issues include whether AI-generated content is eligible for authorship in academic publications. The world's largest academic publisher, Springer Nature, explicitly stated that ChatGPT cannot be credited as an author since AI tools cannot assume the responsibilities associated with authorship (Jabotinsky & Lavi, 2024). These developments underscore the urgent need for comprehensive policies. Robust guidelines must be formulated to address abuses of ChatGPT while upholding academic standards.

Recent research provides various viewpoints on how ChatGPT should be handled in higher education. The literature notes the significant potential to improve educational outcomes by supporting effective learning and creative work. Nonetheless, misuse of ChatGPT has been the source of many debates about academic integrity and genuine learning. It is still uncertain whether the benefits outweigh the risks (Huallpa, 2023). Some authors even argued to ban ChatGPT altogether. Dwivedi et al. (2023) recommended that AI be banned from generating any educational content and suggested a more judicious and open integration of these tools in teaching and research. When considering the array of perspectives from researchers who have voiced their thoughts about ChatGPT in the context of higher education, it is evident that its optimal integration (or ban thereof) is shrouded by varying personal beliefs, cultures, norms, and ethics.

3. Methods

This study followed a qualitative research methodology as described by Coe, Waring, and Hedges (2021) within a case study design. This approach enabled a deeper understanding of participants and helped identify pertinent issues by closely examining specific individuals. Despite the potential rewards of such an inquiry, many scholars, including Yin (2014) have asserted that conducting a comprehensive case study is "one of the most challenging of all social science endeavors" (p. 3). Yin (2014) further characterized a case study as "an empirical inquiry that investigates a contemporary phenomenon (the case) in-depth and within its real-life context, especially when the boundaries between phenomenon and context may not be clearly evident" (p. 16).

Twenty cases—each comprising either a university teacher or a student made up the sample with an equal split of ten teachers and ten students. The university faculty ranged from teachers to assistant professors, associate professors, and full professors while the student participants included undergraduate and graduate students. The unit of analysis centered on the use of ChatGPT. The interpretive framework of constructivism guided this study because it maintains that knowledge evolves as individuals explore multiple facets of a phenomenon (Creswell & Poth, 2017). From a constructivist perspective, Berger and Luckmann (1966) described knowledge as socially constructed rather than objectively defined. Hudson and Ozanne (1988) added that the researcher and the study participants are mutually dependent under this paradigm. All procedures involving human participants were carried out in strict accordance with the ethical guidelines of the UAEU Social Sciences Ethics Committee under the ethics approval reference ERSC_2023_3099.

3.1. Study Context, Participants, and Ethical Considerations

The research took place in the United Arab Emirates, specifically in the Emirate of Abu Dhabi at a large federal university. This site was chosen for its accessibility to the researcher because ChatGPT is used continuously at the institution without restrictions. Participants (see Table 1) were selected using deliberate sampling based on the following criteria: at least six months of ChatGPT experience, current use of ChatGPT, and a willingness to discuss personal experiences in using ChatGPT. Table 1 details participants' gender, months of ChatGPT experience, and affiliated colleges among other specifics.

Table 1. Demographic profile of research participants.

Participant ID	Gender	Experience	College
F1	Male	6 months	Education
F2	Male	6 months	IT
F3	Male	12 months	Law
F4	Male	8 months	Humanities
F5	Male	11 months	Engineering
F6	Female	12 months	Education
F7	Female	12 months	IT
F8	Female	8 months	Business
F9	Female	8 months	Medicine
F10	Female	10 months	Humanities
S1	Male	15 months	Education
S2	Male	10 months	Medicine
S3	Male	6 months	Business
S4	Male	9 months	Law
S5	Male	6 months	IT
S6	Female	12 months	IT
S7	Female	12 months	Education
S8	Female	16 months	Humanities
S9	Female	15 months	Education
S10	Female	6 months	Humanities

3.2. Data Collection Methods

Data for this case study were collected through interviews. Seidman (2012) pointed out interviews provide insight into individuals' lived experiences. Each participant engaged in two hours of in-person interviews related to their specific ChatGPT experiences. The semi-structured format allowed flexibility while maintaining focus on the primary objectives. Before each session, the researchers emailed consent forms to every participant and informed them that the interviews would be recorded. Participants were advised that they could discontinue the interview at any time and were not required to respond to any questions they preferred not to answer.

All participants chose to conduct their interviews on the university campus—either in their offices or in the university library with the exception of one student and two university professors who had scheduling conflicts and opted for online sessions. Each interview began with a brief introduction by the researcher outlining the session's goals and topics. The researcher transcribed all interviews verbatim after recording them with an IC recorder. During the transcription process, identifying information was removed and replaced with pseudonyms to ensure confidentiality.

This case study also included additional data sources such as relevant documents to triangulate the data. These documents were used partly because they are not subject to interviewer manipulation (Merriam, 1998). Inquiries, ChatGPT-generated responses, and assignments or materials created using ChatGPT were gathered with participants' consent. However, only five participants felt comfortable selecting and sharing pertinent documents. Others were unwilling to share personal correspondences with ChatGPT but were open to discussing their experiences in the interviews.

3.3. Data Analysis

Similar to becoming acquainted with a close friend, the research team immersed themselves in the data multiple times before undertaking in-depth analysis, thereby capturing every subtle detail. This thorough approach enabled the creation of multiple codes from each transcript, highlighting both commonalities and individual perspectives in the participants' accounts. The codes were then meticulously organized into coherent categories, and interpretations were validated by referring to real examples and direct quotations. For instance, Table 2 showcases key concepts and participant quotations corresponding to themes one and five that emerged from the analysis.

Table 2. Themes, key concepts, and supporting quotes from participants' perspectives.

Theme 1: Cost-effectiveness and time-saving
Key concepts:
University teachers and students experienced time savings and cost-effectiveness through their use of ChatGPT.
Supporting quotes:
"It is a time-saver."
"Before, it took them 2 hours to do it, and now it takes no more than 15 minutes! This is a significant time-saving improvement!"
Students, in the same fashion, alluded to the idea that ChatGPT is highly "cost-effective" compared to other methods.
Theme 5: Addiction to ChatGPT
Key concepts:
Study participants voiced concerns about the excessive reliance on and noticeable addiction to using ChatGPT.
Supporting quotes:
She cannot imagine the world without ChatGPT.
Another student, overly reliant on ChatGPT, expressed "panic" when trying to edit her assignment during busy hours when ChatGPT was unavailable.
The university teachers lamented that students are becoming more and more obsessive with AI and other applications like ChatGPT.

3.4. Trustworthiness

We employed several strategies focused on four main dimensions—credibility, reliability, transferability, and confirmability to ensure the validity of our findings (Lincoln & Guba, 1985). We triangulated our data and conducted member checks, cross-referencing documents and interviews to confirm consistency across multiple points in time and methods to establish credibility. We also carefully represented participants' responses to minimize biases (Creswell & Poth, 2017). Furthermore, in accordance with Yin's (2014) recommendations for preserving connected "chains of evidence" and developing a robust case study database, we meticulously documented our data collection and analysis methods in a dependability audit (p. 49). We provided in-depth documentation of the research process and underlying assumptions. This will improve transferability and allow other researchers to confidently utilize the findings in similar contexts. We also retained an audit trail of each research phase for confirmability and debriefed academic peers involved in the process to reduce potential bias and subjectivity in the results (Patton, 2015).

4. Results

We identified the following eight themes from an analysis of the codes that revealed several trends in ChatGPT usage in higher education: (1) Cost-effectiveness and time-savings. (2) ChatGPT as a source of information and a flexible tool. (3) ChatGPT's ability to adapt to the user. (4) Prompt engineering competencies in ChatGPT. (5) Addiction to ChatGPT. (6) The misinformation risks with ChatGPT. (7) Academic integrity concerns. (8) A lack of consensus on how to utilize ChatGPT appropriately. These themes brought out both the possibilities and difficulties concerning the implementation of ChatGPT.

4.1. Theme One: Cost-Effectiveness and Time-Saving

Students largely agreed that ChatGPT saved them significant time on coursework and was cost-effective. They highlighted ChatGPT's capacity to save resources by performing tasks that would have otherwise been completed with different instruments or applications. They carefully observed how quickly ChatGPT could finish challenging tasks during discussions in various contexts. In some cases, it carried out activities that would have taken hours of mental and physical efforts. One student even called it a "magic wand," a sentiment that many other students expressed, although in different words. Another student commented on the speed and improvement in workflow overall productivity, stating.

It is a time-saver. There is no doubt about it. ChatGPT can easily find resources for me in the blink of an eye… [and] like editing and proofreading. The other day, I asked it to create a survey based on several domains, and yeah, bingo—there you have it: it paves the way in a very short time.

As for teacher participants at the university that was studied, two professors (labelled F2 and F3) perceived ChatGPT as a last resort. This was particularly true when they were under a lot of strain or were given difficult assignments with brief deadlines. Teachers F2 and F3 explained that they used ChatGPT to revise proposals and create teaching plans and ideas for classroom presentations. ChatGPT was a valuable resource that helped them manage their workloads and still meet deadlines. Another participant faculty member, F5 shared how they recreated "PowerPoint slides with the assistance of ChatGPT." Participant F5 was impressed by its ability to organize everything "in no time" and create main points from larger bodies of text. "Before, it took two hours to complete it," participant F5 noted, "today it takes no more than 15 minutes! This is a time-saving development!"

Students also acknowledged that ChatGPT is cost-effective when compared with other methods. S8 mentioned that since ChatGPT could handle proofreading and editing, she was spared the expense of these services. Similarly, S9 and S10 observed that Grammarly or professional reviewers were not necessary for their projects because ChatGPT could edit their work quickly and at no cost. They added that the fee for premium features, approximately $20, was reasonable given the quality of the service provided. S3 recounted his experience and underscored the tool's effectiveness in saving time and money having used ChatGPT for more than six months.

I remember this one-time ChatGPT saved my life…! My laptop got hacked and everything was wiped out. After formatting, all my saved files and projects were gone. I was extremely nervous because I had to submit a project that day, and it was all gone. I used ChatGPT to help me finish with a little guidance which saved time and money I might have spent on proofreading. I didn't even need to schedule a visit to the writing center for help, since ChatGPT is available 24/7. I was so glad! I received some comments and feedback, but I feel satisfied with the grade because it was a project finished in just a few hours!

In a nutshell, all participants unanimously concluded that ChatGPT offered significant time-saving benefits and cost-effectiveness.

4.2. Theme Two: ChatGPT as a Source of Information and a Flexible Tool

Many participants expressed their appreciation for ChatGPT as a valuable information resource. For most participating students, it was the go-to platform for exploration and verification due to its versatile abilities and interactive dialogue. One student (S1) stated.

ChatGPT is incredibly useful for saving time, especially for us as students. It eliminates the need to search through Google, sift through presentations, or browse Google Scholar for information. Now, ChatGPT can provide all the necessary information in one place and in a short time. You can also ask for more details, almost like having an expert right in front of you. This is a true game-changer—not for being a repertoire of information, but for finishing all kinds of task quickly.

Students such as S3 and S4 had experimented with ChatGPT by posing consulting and case-based questions. Their queries included i.e., "What would you do if you submitted an assignment late?" or " what would you do if you received a low mark on the exam?" When asked whether they adopted ChatGPT's responses, they explained that it depended on the situation rather than always. They also noted that ChatGPT remained neutral and generally provided a suitable response to any scenario.

Participating university teachers shared the view that ChatGPT was exceptionally advanced among other tools and systems to which they were accustomed. Professors F4, F7, F10, and F9 highlighted their capacity to manage tasks such as writing assistance, presentation creation, lesson planning, direct inquiry responses, information searches, coding comprehension, and more. F3 further discussed ChatGPT's flexible applications.

I was amazed by its functions. It's truly magnificent! A groundbreaking invention! It is a comprehensive tool that can do so many things from assisting in writing, providing ideas when your mind is blank, to helping with art, such as poems, stories or descriptions of visual art. I believe there are many capabilities of ChatGPT that I am not even aware of yet.

Both university professors and students consistently praised ChatGPT's adaptability and regarded it as an essential tool. Its ability to handle a broad spectrum of tasks underscores its significance in theoretical and practical contexts.

4.3. Theme Three: ChatGPT's Ability to Adapt to the User

Most participants believed that ChatGPT is a flexible tool for tailored learning support as it can adapt its responses to different learning contexts, levels of expertise, and preferences. One biology student, S7 related.

I tell you about this one time I asked ChatGPT a question about genetics, you know, trying to wrap my head around those Punnett squares and genetic inheritance stuff. So, I was like, " can you break down how Punnett squares work for genetic stuff, but keep it really simple and throw in some real-life examples, you feel me? And guess what? ChatGPT didn't disappoint. It came back at me with a tailor-made explanation that made Punnett squares sound like a breeze. It was all in plain English, and it threw in some practical examples that hit home when it came to genetic inheritance. It dropped some step-by-step action, diagrams, and real-deal examples to make sure I got it, just like I asked.

Another student (S3) continued searching for information but found all efforts futile until posing the correct questions. An IT student (S5) noted using ChatGPT extensively in his information technology courses.

I sometimes find it difficult to keep up with class coding and decoding. For example, I couldn't understand the professor's explanation of coding in a Caesar Cipher Decoder in Python, but ChatGPT helped me in many ways. Even when ChatGPT gave complicated explanations, I asked for simpler ones.

A third student (S6) who studied computer science described her difficulties with SQL searches.

I struggled with writing intricate SQL queries for my database report. I was lost even after the professor went over how to join multiple tables and explained subqueries. I needed to write a query for a database that had three interrelated tables. I asked ChatGPT for assistance. Not only did it provide the correct SQL formulation, but it also explained the logic behind each component.

ChatGPT can deliver individualized support for their learning challenges. Participants demonstrated how it can break down intricate biological concepts or complex coding tasks. Many participants stated that ChatGPT gave them the option to customize responses, including responding to requests and explaining in different ways. User feedback indicated that responses provided by ChatGPT were only useful for the queries they received. In multiple disciplines, these cases highlight how ChatGPT can serve as a learning aid for students.

4.4. Theme Four: Prompt Engineering Competencies in ChatGPT

There was consensus among participants on the issue of the competencies required to effectively use ChatGPT. Both students and teachers expressed that although ChatGPT is useful, one needs prompt engineering skills for it to deliver the best results. For example, one of the students said that ineffective, long or disorganized prompts could produce suboptimal results. Another student underscored the need to receive training to obtain the ability to engineer solid prompts and further asserted that well-crafted prompts yield better outcomes.

On the faculty side of the equation, a member of the College of Business at the university encouraged students to compare well-crafted questions with poorly crafted ones. For example, a poorly constructed question might ask, " what is the thing with opportunity cost in like economics or something?" By contrast, a well-structured inquiry would be, " can you explain the concept of opportunity cost in economics with practical examples of how it affects decision-making in daily life?"

Although ChatGPT is a valuable learning resource, a faculty member remarked that it is not a magic wand. Students who excel with it recognize that their success is closely tied to their capacity to pose the right questions. She shared the story of a student who received a clear and concise explanation that helped him fully understand the concept by carefully framing a query about opportunity cost. While some faculty members highlighted the importance of attending seminars on prompt engineering, another pointed out that well-structured questions lead

to more precise and practical responses. These sessions focus on strategies for asking specific, direct questions and provide concrete examples to help refine searches for improved outcomes. Although ChatGPT holds significant promise as an educational tool, the evidence indicates that users with robust research skills and effective communication strategies substantially enhance its efficacy—a need that educational institutions can address through targeted training.

4.5. Theme Five: Addiction to ChatGPT

ChatGPT is undoubtedly a useful tool. However, students should view it as a supplement to their education rather than a substitute for critical thinking and active learning. Faculty members and students reported instances in which learners became overly dependent on ChatGPT for homework and writing tasks. One faculty member (F1) described a situation in which he suggested certain revisions and offered feedback on a student's project. Using ChatGPT, the student implemented the changes within one or two minutes. He went on to describe the encounter.

It was a shocking moment for me but I could not say anything as there is no policy against using ChatGPT. The student used it immediately and approached me for feedback asking whether what she wrote was right or wrong. I looked at the huge changes that happened in less than five minutes! Knowing the student's level, I knew this was a ChatGPT response. When she gave me the changes, I asked her to briefly explain what changes she made and she could not say a word.

Five students stated that they used ChatGPT to assist them in completing their homework. Five others relied on it primarily for proofreading and editing. They considered it acceptable to use the tool to refine their submissions, although they believed it was unethical to allow the application to handle all aspects of the assignment. One student (S8) even declared that she cannot imagine the world without ChatGPT referring to it as a blessing. In another example, a student upgraded to a premium account after experiencing "panic" when she was unable to revise her assignment during peak hours because ChatGPT was unavailable.

However, most university professors objected to using ChatGPT to complete assignments entirely. Professors shared concerns pertaining to over-reliance on AI owing to the perceived cognitive erosion effect and disruption in the learning process. They repeatedly discussed the learning potential ChatGPT offered and stressed the balanced approach to its application. They emphasized the necessity for students to actively engage in thinking and problem solving. It is essential to create laws governing the best possible use of AI technologies in higher education's teaching and learning processes, given these facts and the possible risks associated with their unchecked application in the classroom.

4.6. Theme Six: Misinformation Risks with ChatGPT

Several participants expressed concerns regarding ChatGPT's unreliability and its propensity to offer information that is incorrect. One of the lecturers offered the following account:

While using ChatGPT, I was presented with several resource lists. I was curious enough to check one of them but to my amazement, none of these sources existed. It was as if it [ChatGPT] had simply made them up.

Other professors described similar episodes that they experienced such as noticing many of their students' essays with references generated with ChatGPT. Other students noticed these facts like student S5, who claimed.

I provided ChatGPT with a math problem, and it gave me the wrong answer! I had the answer in my head, but I wanted to see just how far ChatGPT's limits were, and I never thought it would fail! Even our professors remind us to double-check what we learn from ChatGPT and not just accept it blindly.

Everyone reported instances of ChatGPT providing inaccurate or biased information that was either fabricated or misleading. One teacher noted that responses became more neutral over time with repetitive questioning. For instance, ChatGPT was asked to narrate the UAE's national anthem, and it blended its lyrics with another country's anthem. However, when the question was posed a few months later, ChatGPT can get it correct. This highlights the need to confirm facts that are claimed by ChatGPT and other large language models. All teachers and students must uphold exceptional standards of critical analysis and fact-finding.

4.7. Theme Seven: Academic Integrity Concerns

During interviews with the participants, concerns came up regarding ChatGPT's potential to breach integrity in academics whether it is unwittingly or diabolically copying content. Several professors showed frustration with students who took the responses generated by ChatGPT without making any attempt to engage with the material. One teacher (participant F1) bluntly stated.

I am fed up with students not taking their work seriously and taking ChatGPT for granted without lifting a finger or making a real effort. In my class, I have a large number of students. I can see very similar answers in terms of content and structure in their assignments though some wording is slightly different. I am not opposed to ChatGPT but I am totally against plagiarism.

As for students, they expressed feelings of mixed concern. They stated their commitment to academic integrity yet criticized some of their classmates for relying on verbatim responses generated by AI. This overdependence on ChatGPT blurs the line between what is definitively a guiding tool versus a cheating tool. Student participant S1 noted the following:

Some students depend on ChatGPT 100% and exercise copy-and-paste practice which is plagiarism. This highlights a potential ethical issue. If you're caught, you will be in serious trouble! So why bother? I am not sure if professors have already caught and met with those students but this is a real red flag!

F6, another university teacher, expressed dismay at the high incidence of plagiarism noting that it undermines the true purpose of education. She remarked.

I do not understand the idea behind attending college to learn when students find this double-edged sword software that can do the work for them. Its benefits are promising, but it also has a dark side that breeds laziness if not used properly. Throughout this semester, I identified a significant portion of unrevised texts generated by ChatGPT which is a shame. You always remind your students to use AI software and applications more responsibly without compromising academic integrity and you will still see many examples of plagiarism from ChatGPT.

These critical concerns emphasize the urgency of using ChatGPT thoughtfully and conscientiously. While it serves as an extraordinary tool for learning and writing, it cannot replace genuine critical thinking.

4.8. Theme Eight: A Lack of Consensus on How to Utilize ChatGPT Appropriately

Every participant cast uncertainties when asked about drawing the decisive line between appropriate and inappropriate use of ChatGPT. Students shared examples of professors who encouraged using ChatGPT as a guiding and learning aid while university professors stated that their institutions had yet to formulate clear guidelines and policies regarding ChatGPT use. Although some university professors reported that they did not have formal policies yet, they rely on personal judgment—most acknowledged that policies on ChatGPT use were informal and varied across colleges. Faculty member F8 expressed his experience in establishing guidelines for the use of ChatGPT.

During the first class, I would tell students and emphasize not to let ChatGPT wholly take over their intellectual efforts—and only use it as a guiding aid not as a machine to finish their assignment. I can tell if this [their assignment] is their writing or someone else, and I do not mind confronting them and reporting them to the authority.

Another university teacher saw no danger in using ChatGPT as long as it was applied fairly without plagiarism or undermining students' work though unsure how to formalize guidelines. Five university professors stated that they permitted students to use ChatGPT solely for proofreading and editing. While some emphasized using it as a guiding tool for brainstorming, others preferred that students avoid it entirely but felt unable to prohibit its use because it had become so widespread. F10 disclosed his approach to employing ChatGPT flexibly but with limitations.

It is difficult these days not to use it [ChatGPT], so I do not mind but I need them to use their brain. I set criteria for each task on how to use ChatGPT. I made it clear that in this or that section, you may use ChatGPT, but other sections must be your writing.

Although none of these approaches were explicit, university professors used ChatGPT in diverse ways and with varying restrictions. Conversely, students acknowledged the need to use ChatGPT responsibly and to follow their teachers' advice. Without deviating from course requirements, most students utilized it for refining, editing, and conceptualizing their assignments. Reportedly, from day one, all teachers offered verbal cautions and instructions on how to use ChatGPT. Nonetheless, their syllabi contained no explicit policies. S2 recounted his experience.

One of my teachers explained that we may use ChatGPT for proofreading in our emails and writing, but we must not copy and paste its output verbatim—plagiarism is a clear red flag and easily avoided. Most students agreed that each university instructor has a unique method for detecting artificial-intelligence tools, including ChatGPT, and noted that there are no solid, transparent policies on its use; existing guidelines focus primarily on preventing plagiarism and preserving students' original efforts.

5. Discussion

The first theme, cost-effectiveness and time efficiency aligns with previous research on artificial intelligence in higher education. Zhai (2022) asserted that ChatGPT can substantially reduce both cognitive effort and time required for essay writing. Noy and Zhang (2023) discovered that ChatGPT boosts users' self-confidence and expedites the generation of higher-quality work. Urban et al. (2024) observed more manageable workloads and enhanced performance when ChatGPT was used. Participants in the present study consistently highlighted these time-saving and cost-effective benefits, corroborating earlier findings.

The way students and teachers analyzed ChatGPT in the second theme suggests that it is a flexible and useful source of information. Other studies have reached similar findings and noted its outstanding capability to answer questions, writing, and assisting teachers with lesson plans, tests, quizzes, and various other activities in the classroom (Aydın & Karaarslan, 2023; Karyotaki et al., 2022; Kasneci et al., 2023; Tlili et al., 2023). ChatGPT has also been utilized for moderating classes and presenting challenging problem-solving activities (Noy & Zhang, 2023). However, more caution needs to be taken when using ChatGPT for other reasons, especially regarding the accuracy of its outputs and whether the training data and outputs are free from bias despite its functionality and contributions.

As results become tailored to a broader array of cultures and viewpoints, as identified in theme three, ChatGPT's answers will be able to deliver targeted responses. This will also enable it to more effectively and accurately adapt to specific learning requirements and contexts in the examples and output it provides. As seen from participant data, the system was able to customize its responses to match the questions of the users to simplify complex problems in areas such as biology, computing, and mathematics. This customizability is supported by several studies in the literature. For example, Abdallah et al. (2024) expressed this sentiment in terms of ChatGPT being available as an on-demand tutor to provide context-specific explanations for various students with different learning styles. Lin (2023) and Qadir (2023) conveyed a similar idea by accentuating the ability of the LLM to accommodate the needs of students in large classrooms where personalized attention was not feasible. This extended to the generation and adaptation of visual aids tailored to the learning preferences and ability levels of the students (Lin, 2023; Qadir, 2023).

Throughout the present study, it became evident that while ChatGPT was capable of impressive personalization and responses, both of these aspects can be improved by developing prompt engineering competencies in ChatGPT (theme three). As elucidated in prior segments of this research, participants indicated that well-crafted questions were very beneficial in improving ChatGPT's output. Findings from the literature align with that notion, as seen in the need highlighted by Tlili et al. (2023) and Vuorikari et al. (2022) for AI tools to be used with sufficient knowledge about LLM-operation to be able to critically think about their requests before inputting questions into ChatGPT. Ekin (2023) in another study underscored the need to formulate precise and context-specific prompts. Student outcomes can be improved and learners become more competent in a very

rapidly evolving digital landscape by honing in on these skills. Therefore, it is timely and also critical to introduce targeted training programs and workshops into education.

Unfortunately, there is opposition in seemingly all things in life. Theme five serves as a reality check by underscoring ChatGPT's potential to be addictive. Most faculty participants voiced serious concerns about students' overreliance on AI. ChatGPT could be very effective in lesson preparation; they recognized the caveat that ChatGPT could hinder mental effort and critical thinking. As some teachers and professors shared, many students became addicted to the quick results ChatGPT provided and became less engaged with the educational process. In some cases, students became completely disengaged. Research corroborates this as encapsulated by Kasneci et al. (2023) warning that excessive dependence on AI could stifle cognitive growth and be a quick path toward unethical behavior. When students are overwhelmed, but not exclusively, the ease of offloading work onto ChatGPT and submitting as one's own work makes this practice all too common. Kamoun et al. (2023) found that many faculty members believed ChatGPT discouraged critical thinking and problem-solving, raising concerns that overreliance on the tool could hinder students' cognitive development. Others have written about the area of learning such as writing skills that stand to suffer the most from excessive AI use (Farhi et al., 2023).

The danger of dependence as noted ties in directly with the risk of misinformation which is the sixth theme as some students simply copy and paste ChatGPT's responses without verification. Participants in the study reported "hallucinated" references and fabricated citations when using ChatGPT as a research assistant. These matters need more attention. The improvement of reliability of ChatGPT must be improved through more stringent evaluations of its output. Hariri (2023) and Tlili et al. (2023) pointed out that data from ChatGPT, or other large language models need immediate validation before use. This is a problem that many scholars and teachers need to understand and should inform others to fix (Brumfiel, 2023; Zhan et al., 2023). The risk of misinformation in theme six is only exacerbated by ChatGPT's thoughtless use or misuse as highlighted by other themes.

Another challenging dilemma brought on by the misuse of AI in education is upholding academic integrity as discussed in theme seven. Most participants were concerned that ChatGPT often compromised the integrity of the learning process, especially when it came to plagiarism. Teachers expressed frustration about assignments turned in by students that were entirely ChatGPT-generated which showed little interaction with the material at hand. In contrast with conventional plagiarism, copying and pasting ChatGPT-generated responses removes the user one step further from directly copying the work of other authors. This makes it a multifaceted issue that creates questions about what constitutes plagiarism, how credit should be given to authors from whose work ChatGPT was trained, and especially the ethics involved with AI-generated content. ChatGPT may be considered an author and similar plagiarism standards at schools should apply. Many researchers have warned that overreliance on AI can restrict intellectual development and encourage unethical conduct (Kamoun et al., 2023; Kasneci et al., 2023). AI should supplement, not supplant, authentic effort and in-depth analysis. Consensus has yet to be achieved among university teachers and students on the appropriate and ethical use of ChatGPT as an assistant in the educational process.

The eighth and final theme of this study reflects the unanswered questions about how to properly integrate ChatGPT into higher education. Participant opinions differed when it came to differentiating appropriate use from misuse. This has been the cause of many debates, increasingly over time in the academic community. Among university teachers, there are strong proponents of stricter and more explicit guidelines for AI use, while others prefer a more flexible regulatory approach. The situation becomes even more bewildering when guidance from education authorities and administrators is lacking. Many university administrators and educational regulatory bodies are having the same debates as teachers and even students. This makes it all the more necessary for broader academic discussions and regulations that balance ChatGPT's benefits and disadvantages.

6. Conclusion and Implications

ChatGPT and other artificial intelligence technologies have substantially impacted education and society. It is ever increasingly evident that these tools are evolving very quickly, even exponentially. Their rapid expansion is a profound transformation that universities cannot overlook. The authors of the present study have sought to address this issue in an attempt to proactively disseminate knowledge about the advent of AI to enable a healthier approach to its usage while preserving the integrity of the learning process. We employed a case-study approach to capture the perceptions of university teachers and students by combining interviews with document analysis. The results demonstrate that in the absence of existing guidelines for ChatGPT usage, it is necessary to carefully weigh the opportunities against the challenges.

ChatGPT provides notable benefits in helping students learn content more effectively, and in helping teachers teach better. Nevertheless, there are unique problems these students and teachers may face in the world of higher learning. For instance, ChatGPT can prove to be helpful but at the same time can be over-relied upon and applied toward automating much of the cognitive effort that is considered integral to the learning process. As a result, the authors suggest that targeted training workshops be developed for these teachers so that they might better integrate and apply ChatGPT as a supplementary educational aid. Additional benefits for universities could include rethinking the curriculum, the methods of assessment, and the general pedagogy to better align with the existence and prevalence of ChatGPT. Moreover, various ethical issues, such as bias misinformation and made-up content require much more focus. Educational evaluation, data protection, plagiarism, consent of the authors and ChatGPT's impact on education must be balanced out. Alarmingly, some students reported dependence on ChatGPT to the extent that they struggled with completing basic tasks independently. Substantial efforts must be made to prevent misuse and unethical actions. This study's findings suggest a number of issues that require further research to mitigate the adverse ramifications of ChatGPT and better utilize its advantages within the educational setting.

Future studies could assess how ChatGPT makes students more active participants in their learning even in a large classroom and how this affects their learning outcomes. Some researchers might focus on university instructors' experiences with utilizing ChatGPT within course frameworks and how it impacts their teaching. Furthermore, some researchers could conduct studies tracking the development of students' critical thinking and writing skills over time. There is also a significant gap in research regarding the responsible use of ChatGPT in

higher education and the policies needed to educate decision-makers for effective governance of its use. While there is great potential in ChatGPT to positively transform academic life, it is essential to acknowledge the numerous inherent risks. It is undoubtedly beneficial and necessary to figure out how to use ChatGPT responsibly with due consideration of the oversight and ethical principles involved.

References

Abdallah, A. K., Alkaabi, A. M., Mehiar, D. A., & Aradat, Z. A. (2024). Chatbots in classrooms: Tailoring education and boosting engagement. In A. Abdallah, A. Alkaabi, & R. Al-Riyami (Eds.), Cutting-edge innovations in teaching, leadership, technology, and assessment. In (pp. 166–181): IGI Global. https://doi.org/10.4018/979-8-3693-0880-6.ch012.

Agarwal, S., Agarwal, B., & Gupta, R. (2022). Chatbots and virtual assistants: A bibliometric analysis. *Library Hi Tech*, *40*(4), 1013–1030. https://doi.org/10.1108/LHT-09-2021-0330

Aydın, Ö., & Karaarslan, E. (2023). Is ChatGPT leading generative AI? What is beyond expectations? *Academic Platform Journal of Engineering and Smart Systems*, *11*(3), 118-134. https://doi.org/10.21541/apjess.1293702

Baidoo-Anu, D., & Ansah, L. O. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Journal of AI*, *7*(1), 52-62. https://doi.org/10.61969/jai.1337500

Bang, Y., Cahyawijaya, S., Lee, N., Dai, W., Su, D., Wilie, B., . . . Chung, W. (2023). A multitask, multilingual, multimodal evaluation of chatgpt on reasoning, hallucination, and interactivity. *arXiv preprint arXiv:2302.04023*. https://arxiv.org/abs/2302.04023

Berger, P. L., & Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. Garden City, NY: Doubleday.

Brewster, J., Arvanitis, L., & Sadeghi, M. K. (2023). *Could ChatGPT become a monster misinformation superspreader? NewsGuard*. Retrieved from https://www.newsguardtech.com/misinformation-monitor/jan-2023/

Brumfiel, G. (2023). *We asked the new AI to do some simple rocket science. It crashed and burned. NPR*. Retrieved from https://www.npr.org/2023/02/02/1152481564/we-asked-the-new-ai-to-do-some-simple-rocket-science-it-crashed-and-burned

Chatterjee, J., & Dethlefs, N. (2023). This new conversational AI model can be your friend, philosopher, and guide... and even your worst enemy. *Patterns*, *4*(1). https://doi.org/10.1016/j.patter.2022.100676

Chui, M., Manyika, J., & Miremadi, M. (2018). What AI can and can't do (yet) for your business. *McKinsey Quarterly*, *2018*(1), 96–108.

Coe, R., Waring, M., & Hedges, L. V. (2021). *Research methods and methodology in education*. London, UK: SAGE Publications.

Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Thousand Oaks, CA: Sage.

Cu, M. A., & Hochman, S. (2023). *Scores of Stanford students used ChatGPT on final exams. The Stanford Daily*. Retrieved from https://stanforddaily.com/2023/01/22/scores-of-stanford-students-used-chatgpt-on-final-exams-survey-suggests/

Dashly. (2023). *Empowering education: 11 remarkable benefits of chatbots for your school and students. Dashly*. Retrieved from https://www.dashly.io/blog/benefits-of-chatbots-in-education/. [Accessed August 1, 2023]

Dowling, M., & Lucey, B. (2023). ChatGPT for (finance) research: The Bananarama conjecture. *Finance Research Letters*, *53*, 103662. https://doi.org/10.2139/ssrn.4322651

Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., . . . Ahuja, M. (2023). Opinion Paper: "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management*, *71*, 102642. https://doi.org/10.1016/j.ijinfomgt.2023.102642

Ekin, S. (2023). Prompt engineering for ChatGPT: A quick guide to techniques, tips, and best practices. *TechRxiv*. https://doi.org/10.36227/techrxiv.22683919.v2

Farhi, F., Jeljeli, R., Aburezeq, I., Dweikat, F. F., Al-shami, S. A., & Slamene, R. (2023). Analyzing the students' views, concerns, and perceived ethics about chat GPT usage. *Computers and Education: Artificial Intelligence*, *5*, 100180. https://doi.org/10.1016/j.caeai.2023.100180

Farrokhnia, M., Banihashem, S. K., Noroozi, O., & Wals, A. (2024). A SWOT analysis of ChatGPT: Implications for educational practice and research. *Innovations in Education and Teaching International*, *61*(3), 460-474. https://doi.org/10.1080/14703297.2023.2195846

Fernández-Batanero, J. M., Montenegro-Rueda, M., Fernández-Cerero, J., & García-Martínez, I. (2022). Digital competences for teacher professional development. Systematic review. *European Journal of Teacher Education*, *45*(4), 513-531.

Giray, L. (2023). Prompt engineering with ChatGPT: A guide for academic writers. *Annals of Biomedical Engineering*, *51*(12), 2629-2633. https://doi.org/10.1007/s10439-023-03272-4

Goulding, G. (2023). *Students at Cape Coral High School accused of using artificial intelligence to cheat on essay. NBC2 News*. Retrieved from https://www.gulfcoastnewsnow.com/

Guo, K., Zhong, Y., Li, D., & Chu, S. K. W. (2023). Effects of chatbot-assisted in-class debates on students' argumentation skills and task motivation. *Computers & Education*, *203*, 104862. https://doi.org/10.1016/j.compedu.2023.104862

Hariri, W. (2023). Unlocking the potential of ChatGPT: A comprehensive exploration of its applications, advantages, limitations, and future directions in natural language processing. *arXiv preprint arXiv:2304.02017*. https://doi.org/10.48550/arXiv.2304.02017

Hsu, T., & Thompson, S. A. (2023). *Disinformation researchers raise alarms about A.I. chatbots. The New York Times*. Retrieved from https://www.nytimes.com/2023/02/08/technology/ai-chatbots-disinformation.html

Huallpa, J. J. (2023). Exploring the ethical considerations of using Chat GPT in university education. *Periodicals of Engineering and Natural Sciences*, *11*(4), 105-115.

Hudson, L. A., & Ozanne, J. L. (1988). Alternative ways of seeking knowledge in consumer research. *Journal of Consumer Research*, *14*(4), 508-521. https://doi.org/10.1086/209132

Iqbal, N., Ahmed, H., & Azhar, K. A. (2022). Exploring teachers' attitudes towards using ChatGPT. *Global Journal for Management and Administrative Sciences*, *3*(4), 97-111.

Jabotinsky, H. Y., & Lavi, M. (2024). Can ChatGPT and the like be your coauthors? *Cardozo Arts & Entertainment Law Journal*, *42*(2), 347.

Kalla, D., Smith, N., Samaah, F., & Kuraku, S. (2023). Study and analysis of ChatGPT and its impact on different fields of study. *International Journal of Innovative Science and Research Technology*, *8*(3). https://doi.org/10.2139/ssrn.4452780

Kamoun, F., Ayeb, W. E., Jabri, I., Sifi, S., & Iqbal, F. (2023). Knowledge, attitude, and perception towards ChatGPT among university students and faculty: A preliminary exploration. *International Journal of Educational Technology*, 247–266. https://doi.org/10.22492/issn.2188-1162.2023.20

Karaman, M. R., & Goksu, I. (2024). Are lesson plans created by ChatGPT more effective? An experimental study. *International Journal of Technology in Education*, *7*(1), 107–127. https://doi.org/10.46328/ijte.607

Karyotaki, M., Drigas, A., & Skianis, C. (2022). Chatbots as cognitive, educational, advisory & coaching systems. *Technium Social Sciences Journal*, *30*, 109–126.

Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., . . . Hüllermeier, E. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, *103*, Article 102274. https://doi.org/10.1016/j.lindif.2023.102274

Khalil, R., Tairab, H., Qablan, A., Alarabi, K., & Mansour, Y. (2023). STEM-Based curriculum and creative thinking in high school students. *Educ. Sci.* *13*(12), 1195; https://doi.org/10.3390/educsci13121195

Kung, T. H., Cheatham, M., Medenilla, A., Sillos, C., De Leon, L., Elepaño, C., . . . Maningo, J. (2023). Performance of ChatGPT on USMLE: potential for AI-assisted medical education using large language models. *PLoS Digital Health*, *2*(2), e0000198. https://doi.org/10.1371/journal.pdig.0000198

Limo, F. A. F., Tiza, D. R. H., Roque, M. M., Herrera, E. E., Murillo, J. P. M., Huallpa, J. J., . . . Carranza, C. P. M. (2023). Personalized tutoring: ChatGPT as a virtual tutor for personalized learning experiences. *Przestrzeń Społeczna (Social Space)*, *23*(1), 293-312.

Lin, J. (2023). ChatGPT and moodle walk into a bar: A demonstration of AI's mind-blowing impact on E-Learning. *Available at SSRN 4393445*. https://doi.org/10.2139/ssrn.4393445

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.

Liu, P., Yuan, W., Fu, J., Jiang, Z., Hayashi, H., & Neubig, G. (2023). Pre-train, prompt, and predict: A systematic survey of prompting methods in natural language processing. *ACM Computing Surveys, 55*(9), 1-35. https://doi.org/10.1145/3560815

Lo, C. K. (2023). What is the impact of ChatGPT on education? A rapid review of the literature. *Education Sciences, 13*(4), 410. https://doi.org/10.3390/educsci13040410

Luo, Q., Puett, M. J., & Smith, M. D. (2023). A perspectival mirror of the elephant: Investigating language bias on Google, ChatGPT, Wikipedia, and YouTube. *arXiv preprint arXiv:2303.16281*. https://doi.org/10.48550/arXiv.2303.16281

Manohar, N., & Prasad, S. S. (2023). Use of ChatGPT in academic publishing: A rare case of seronegative systemic lupus erythematosus in a patient with HIV infection. *Cureus, 15*(2). https://doi.org/10.7759/cureus.34616

Merriam, S. B. (1998). *Qualitative research and case study applications in education* (2nd ed.). San Francisco, CA: Jossey-Bass Publishers.

Meyer, J. G., Urbanowicz, R. J., Martin, P. C., O'Connor, K., Li, R., Peng, P.-C., . . . Gonzalez-Hernandez, G. (2023). ChatGPT and large language models in academia: Opportunities and challenges. *BioData Mining, 16*(1), 20. https://doi.org/10.1186/s13040-023-00339-9

Moustafa, A., Opoku, M. P., & Belbase, S. (2022). Using tactile imagery to teach geometry to students with visual impairments in the United Arab Emirates. *Research in Developmental Disabilities, 129*. https://doi.org/10.1016/j.ridd.2022.104309

Mustafa, A., Safi, M., Opoku, M. P., & Mohamed, A. M. (2022). The impact of health status on attitudes toward COVID-19 vaccination. *Health Science Reports, 5*(4). https://doi.org/10.1002/hsr2.744

Noy, S., & Zhang, W. (2023). Experimental evidence on the productivity effects of generative artificial intelligence. *Science, 381*(6654), 187-192. https://doi.org/10.1126/science.adh2586

Park, P. S., Schoenegger, P., & Zhu, C. (2023). "Correct answers" from the psychology of artificial intelligence. *arXiv*. https://doi.org/10.48550/arXiv.2302.07267

Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4th ed.). Thousand Oaks, CA: Sage Publications.

Pozo-Sánchez, S., López-Belmonte, J., Rodríguez-García, A.-M., & López-Núñez, J.-A. (2020). Teachers' digital competence in using and analytically managing information in flipped learning (Competencia digital docente para el uso y gestión analítica informacional del aprendizaje invertido). *Culture and Education, 32*(2), 213-241. https://doi.org/10.1080/11356405.2020.1757980

Qablan, A. & Al-Qaderi, S. (2009). How to change university faculty members' attitudes and behavior in the context of education for sustainable development. *Applied Environmental Education and Communication 8,184-194*. DOI: 10.1080/15330150903269407

Qadir, J. (2023). *Engineering education in the era of ChatGPT: Promise and pitfalls of generative AI for education*. Paper presented at the 2023 IEEE Global Engineering Education Conference (EDUCON) (pp. 1–9). IEEE. https://doi.org/10.1109/EDUCON54358.2023.10125121.

Rahman, M. M., & Watanobe, Y. (2023). ChatGPT for education and research: Opportunities, threats, and strategies. *Applied sciences, 13*(9), 5783. https://doi.org/10.3390/app13095783

Sato, M., & Roth, E. (2023). *CNET found errors in more than half of its AI-written stories. The Verge*. Retrieved from https://www.theverge.com/2023/1/25/23571082/cnet-ai-written-stories-errors-corrections-red-venture

Seidman, I. (2012). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (4th ed.). New York: Teachers College Press.

Selber, S. A. (2023). Artificial intelligence in higher education: A pragmatic approach to integration and safe usage. *Journal of Higher Education and Technology, 12*(4), 114-130.

Sharples, M. (2022). Automated essay writing: An AIED opinion. *International Journal of Artificial Intelligence in Education, 32*(4), 1119-1126. https://doi.org/10.1007/s40593-022-00322-9

Singh, D. (2023). ChatGPT: A new approach to revolutionise organisations. *International Journal of New Media Studies, 10*(1), 57-63.

Tlili, A., Shehata, B., Adarkwah, M. A., Bozkurt, A., Hickey, D. T., Huang, R., & Agyemang, B. (2023). What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education. *Smart Learning Environments, 10*(1), 15. https://doi.org/10.1186/s40561-023-00218-5

Transformer, & Zhavoronkov, A. (2022). Rapamycin in the context of Pascal's Wager: Generative pre-trained transformer perspective. *Oncoscience, 9*, 82-84. https://doi.org/10.18632/oncoscience.571

Urban, M., Děchtěrenko, F., Lukavský, J., Hrabalová, V., Svacha, F., Brom, C., & Urban, K. (2024). ChatGPT improves creative problem-solving performance in university students: An experimental study. *Computers & Education, 215*, 105031. https://doi.org/10.1016/j.compedu.2024.105031

Von Hippel, P. T. (2023). *ChatGPT is not ready to teach geometry (yet). Education Next*. Retrieved from https://www.educationnext.org/chatgpt-is-not-ready-to-teach-geometry-yet/

Vuorikari, R., Kluzer, S., & Punie, Y. (2022). DigComp 2.2: The digital competence framework for citizens—With new examples of knowledge, skills and attitudes. *Publications Office of the European Union*. https://doi.org/10.2760/115376

Wang, Y., Zhou, Y., Yang, S., & Chen, X. (2023). Understanding the limitations of ChatGPT in educational settings: Hallucinations and performance gaps in complex queries. *Journal of Artificial Intelligence in Education Research, 8*(2), 134–150.

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Thousand Oaks, CA: Sage Publications.

Zhai, X. (2022). ChatGPT user experience: Implications for education. *Available at SSRN 4312418*. https://doi.org/10.2139/ssrn.4312418

Zhan, X., Xu, Y., & Sarkadi, S. (2023). *Deceptive AI ecosystems: The case of ChatGPT*. Paper presented at the Proceedings of the 5th International Conference on Conversational User Interfaces (pp. 1–6). ACM. https://doi.org/10.1145/3571884.3603754.

Zhang, P., & Tur, G. (2024). A systematic review of ChatGPT use in K-12 education. *European Journal of Education, 59*(2), e12599. https://doi.org/10.1111/ejed.12599