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Original article

Investigating Students' Awareness, Usage, and Perceptions of ChatGPT in Libyan Higher Education: A Case Study at the University of Benghazi in 2024

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Abstract
The world is experiencing rapid technological advancements, with efforts to integrate technology across all sectors. Artificial Intelligence (AI) is reshaping various industries, including education, making teaching and learning more efficient and accessible. One such tool, ChatGPT, has potential applications in education, but students need to understand both its benefits and risks. While ChatGPT can enhance learning when used properly, overreliance on it may hinder the learning process. This research examined students' awareness of ChatGPT and their perceptions of its benefits and risks in academic and personal contexts. The study gathered quantitative data through surveys from 108 students across different disciplines at the University of Benghazi Qaminis branch, Libya. The findings reveal that while many students are familiar with ChatGPT, they do not consistently use it for educational purposes. Furthermore, several students recognize both the positive and negative impacts of ChatGPT on learning, but believe that universities should provide more information on effectively incorporating it into learning activities. This study highlighted that while ChatGPT can support educational activities, proper guidance and training for students and lecturers are necessary to ensure its responsible and legal use, ultimately enhancing the educational process.
Keywords: Artificial Intelligence (AI), ChatGPT, Student Awareness, Teaching and Learning, University of Benghazi.

Introduction

Artificial Intelligence (AI) has transitioned from theoretical research and science fiction into a pervasive component of everyday life, underscoring its significance and widespread impact [1,2]. In education, AI plays a critical role in enhancing personalized learning, automating administrative tasks, and supporting virtual tutors, ultimately improving student outcomes and engagement [3,4]. Integrating AI into the educational domain has introduced transformative changes, evolving from essential interactive tools to sophisticated applications that utilize deep learning and machine learning, offering innovative solutions to various educational challenges [5].

AI is a specialized branch of computer science that focuses on developing systems capable of performing tasks that traditionally require human cognitive functions, such as learning, reasoning, planning, and environmental interaction [6,7]. One of the critical subfields of AI is Machine Learning, which involves the creation of algorithms that enable systems to autonomously improve their performance over time without manual programming for each task [8,9]. Closely related is Deep Learning, an advanced subset of machine learning that employs neural networks with multiple layers to process and analyze complex data. It excels in applications such as image and sound recognition, natural language processing, and gaming [10].

Natural Language Processing (NLP) is another crucial area of AI, focusing on enabling machines to comprehend and interact with human language, facilitating tasks such as text interpretation, conversational agents, and language translation [11]. Additionally, Computer Vision, a significant domain of AI, involves analyzing and interpreting visual data from images and videos, enabling systems to identify objects, faces, and movements [12]. Lastly, Robotics is a critical AI subfield concerned with designing and creating robots capable of performing physical tasks in various environments, including mobility, exploration, and interaction with their surroundings [13,14].

AI offers transformative potential for enhancing the educational process, providing opportunities for more effective and engaging learning experiences. AI's impact on education ranges from simple interactive tools to sophisticated deep learning and machine learning applications that offer innovative solutions to educational challenges [15]. The evolution of AI in education encompasses the development of intelligent educational software, advanced e-learning platforms, and data analytics tools, all of which empower educators to make data-driven decisions [16]. As AI becomes increasingly embedded in daily life and educational practices, its influence on shaping educational outcomes grows [17,18].

The integration of AI in education has been further revolutionized with the advent of ChatGPT [19]. The rapid advancements in AI technology have significantly enhanced the accessibility, scalability, and effectiveness of text-generation tools like ChatGPT [20] [21]. ChatGPT was developed by an AI research company (OpenAI) based in San Francisco, California [22]. ChatGPT is a form of generative AI that facilitates conversational interaction using the Generative Pre-trained Transformer (GPT-3) model. This model generates and refines text output through deep learning [23]. Its ability to learn from previous interactions and adjust based on feedback highlights its advanced capabilities. The release of GPT-3 in 2020 introduced

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a powerful language model that generates text by analyzing billions of words of training data and understanding the relationships between words and phrases [24]. Building on this foundation, GPT-4 was released in March 2023 and represents a significant advancement over GPT-3. Unlike GPT-3, GPT-4 introduces multimodal capabilities, allowing it to process and understand text and images [25]. This enhancement enables GPT-4 to generate more nuanced and contextually relevant responses, handle ambiguities more effectively, and demonstrate improved creativity and reasoning abilities [26]. GPT-4 is accessible via subscription or pay-per-use through OpenAI's API or services like ChatGPT Plus.

ChatGPT has emerged as a versatile educational tool, offering interactive support to students from any location at any time [27]. Its applications span test preparation, language learning, and writing assistance. In language learning, ChatGPT corrects grammatical and syntactic errors and provides students with realistic conversations to practice language skills [28-30]. Additionally, ChatGPT offers encouragement, helping students manage time, organize tasks, and address challenges effectively [31] [32]. One of ChatGPT's critical strengths is its ability to personalize learning experiences. For instance, Chen et al. (2020) [33] demonstrated that ChatGPT could enhance personalized tutoring, particularly in subjects like math, resulting in improved learning outcomes. Furthermore, ChatGPT supports writing tasks by offering suggestions, grammar checks, and proofreading, which enhance students' writing skills. Its instant feedback and adaptive learning systems enable it to create environments that adjust based on student progress, further improving educational outcomes [34].

However, ChatGPT presents particular challenges, particularly in ethics and academic integrity. The ease with which students can use AI to generate text or complete assignments raises concerns about plagiarism and academic dishonesty [35-37]. This rapid adoption underscores the need for proper guidance and awareness of AI use in education [38-39]. Security and privacy concerns also arise with the use of AI models like ChatGPT in education, particularly regarding the handling of personal data [40]. Moreover, ChatGPT's training data limits its knowledge, which can lead to inaccuracies or outdated information. There is also the potential for students to become overly reliant on AI tools, which may stifle critical thinking and creativity. Additionally, the lack of emotional interaction in AI-based learning has been noted as a limitation. Studies suggest that human interaction remains more effective for learning outcomes than AI-based tutoring alone.

This study examines the awareness, usage, and perceptions of ChatGPT among students at the University of Benghazi in Libya in 2024. Libyan higher education faces unique challenges due to political instability, inadequate infrastructure, and limited access to advanced technologies [41]. These issues hinder the integration of modern tools like ChatGPT despite its potential to enhance learning outcomes. Many students lack reliable internet access and digital literacy skills, while concerns about academic integrity and ethical AI use remain unaddressed [42]. This case study seeks to assess how students at the university engage with ChatGPT for educational tasks, their awareness of its benefits and risks, and their overall attitudes toward AI in education.

Methods

The primary objective of this study is to comprehensively evaluate Libyan college students' awareness levels regarding ChatGPT, explore its usage within educational and academic contexts, and understand their perceptions of its benefits and associated risks. A quantitative research approach was employed to achieve these objectives, focusing on data collection through a structured online questionnaire. The questionnaire, meticulously designed using Google Forms, was disseminated via email and social media platforms. This distribution strategy was chosen to maximize reach and ensure the engagement of a broad and diverse student demographic.

The online questionnaire featured a combination of multiple-choice questions and open-ended questions. The multiple-choice questions aimed to assess the students' familiarity with ChatGPT, including their level of knowledge and usage patterns. The open-ended questions were designed to capture more nuanced insights into their perceptions of ChatGPT's benefits and challenges. This combination of question types allowed for quantitative analysis and richer qualitative insights, albeit the primary focus remained on quantitative data. By relying exclusively on online questionnaires, the study leveraged the convenience and efficiency of digital tools, ensuring data collection from a wide array of students. This method not only facilitated a large sample size but also standardized the data collection process, enhancing the reliability and comparability of the results. The exclusivity of the online format aimed to reduce variability in responses that might arise from differing data collection methods.

The data collected through the online questionnaires were rigorously analyzed using SPSS (Statistical Package for Social Sciences) version 24. Quantitative data analysis involves several key statistical techniques. Descriptive statistics were used to summarize and describe the fundamental characteristics of the data, providing an overview of the students' awareness levels and usage patterns. Inferential statistical methods were applied to identify significant trends, correlations, and response differences. This analytical approach offered a comprehensive view of how students interact with ChatGPT, highlighting prevalent trends and variations in perceptions. The quantitative focus of the analysis ensured a clear, objective, and data-driven assessment of students' interactions with ChatGPT. This approach allowed for a precise measurement

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of the extent of awareness and usage and a detailed understanding of perceived benefits and risks. The structured methodology and robust data analysis provided valuable insights into the role of ChatGPT in the educational landscape, contributing to a deeper understanding of its impact on academic learning and student experiences.

Results and Discussion

The study surveyed 108 students from Benghazi University (Qaminis branch), representing various academic disciplines, to assess their awareness and perceptions of ChatGPT. The results are categorized into key areas: awareness and familiarity with ChatGPT, perceived benefits, and concerns regarding its use in education. As shown in Figure 1, a significant portion of students (77.8%) reported being aware of ChatGPT, while 14.8% had limited knowledge, and 8% had never heard of it. The responses were analyzed based on the students' majors, comparing answers provided by computer science students with those from other fields, such as engineering, economics, media, etc.

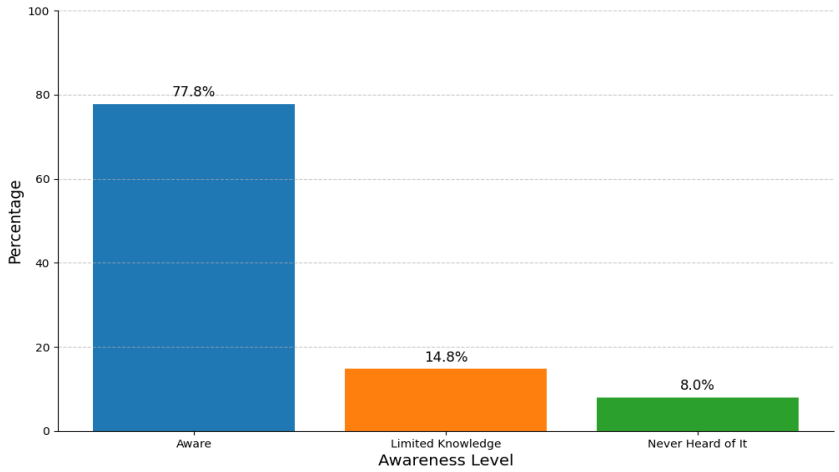

Figure 1. Awareness of ChatGPT among students

Figure 2 presents a chart comparing the percentage of students familiar with ChatGPT across the major fields. The data indicates that students majoring in Computer Science are notably more familiar with ChatGPT than their peers in engineering, economics, media, and other. Using the chi-square test, a statistically significant difference was found between the responses of students with a computer science background and those from other majors. Computer science students were much more familiar with ChatGPT than their peers in different disciplines. This indicates that students with information technology backgrounds respond differently to the questions. Regarding usage patterns among students aware of ChatGPT, 67.6% had used the tool at least once for academic purposes. Meanwhile, 20.4% had never used it, and 12% had used it for purposes other than educational needs.

The questionnaire included a question about the source of students' awareness regarding ChatGPT. Figure 3 displays the distribution of how students became aware of ChatGPT. Most students (81%) reported not receiving formal instruction or guidance on using ChatGPT, indicating a potential gap in awareness efforts. Only 15.7% received limited guidance, while a small fraction (2.8%) learned about the tool through formal educational resources. This highlights the need for increased educational initiatives and resources to improve students' understanding and effective use of ChatGPT in their academic work.

Students identified several benefits associated with using ChatGPT in their studies. Figure 4 illustrates the main advantages of using ChatGPT, as reported by participants. The most significant portion of participants (64.6%) identified help with research and gathering information as the primary benefit, followed by personal learning (24.2%), help with homework (7.4%), and writing assistance (3.8%).

Despite the perceived benefits, students voiced concerns about using ChatGPT in education. The main concern noted by 42.9% of respondents was that too much reliance on ChatGPT could harm their critical thinking and problem-solving skills, making them too dependent on AI for answers. Additionally, 25.7% of students pointed out problems with the accuracy and reliability of the information generated by ChatGPT, citing instances of incorrect or misleading content. About 21% of students felt that ChatGPT could reduce meaningful interactions with peers and instructors, which are crucial for a well-rounded educational experience. A smaller group, 6.7%, expressed concerns about academic integrity, fearing that dependence on ChatGPT could encourage academic dishonesty, such as plagiarism or submitting AI-generated work as their own. Other problems included security and legal implications associated with using AI tools in education (see Figure 5).

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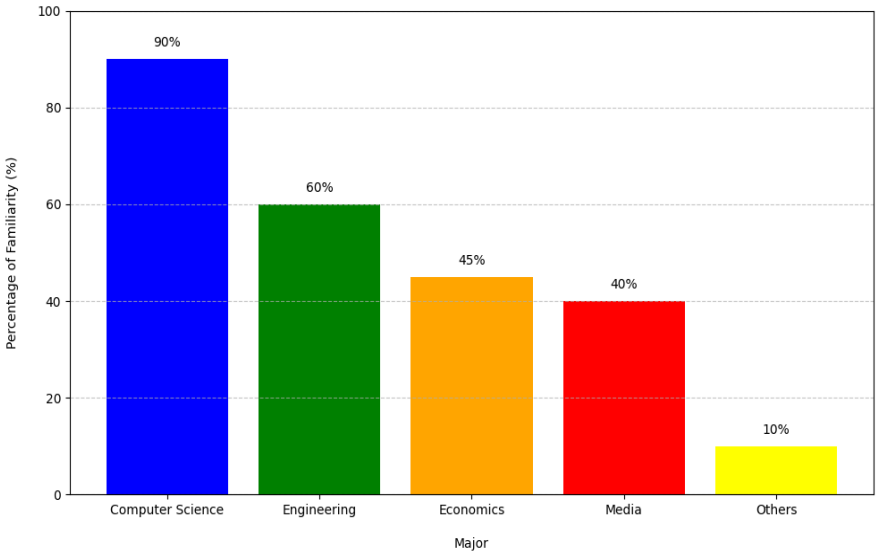

Figure 2. Comparison of familiarity with ChatGPT by major

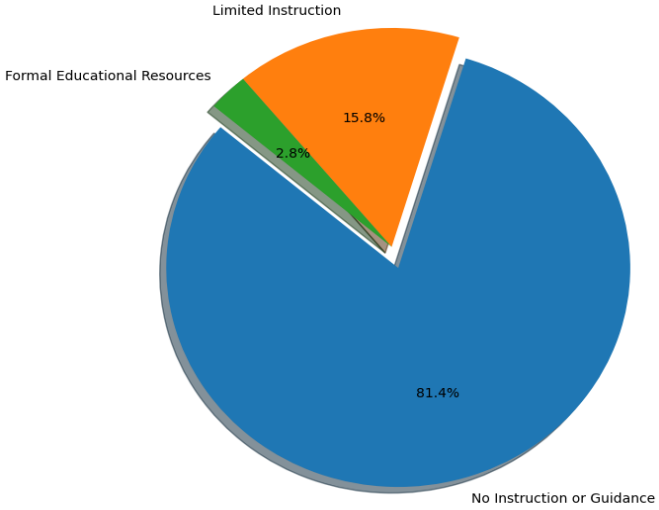

Figure 3. Sources of awareness about ChatGPT

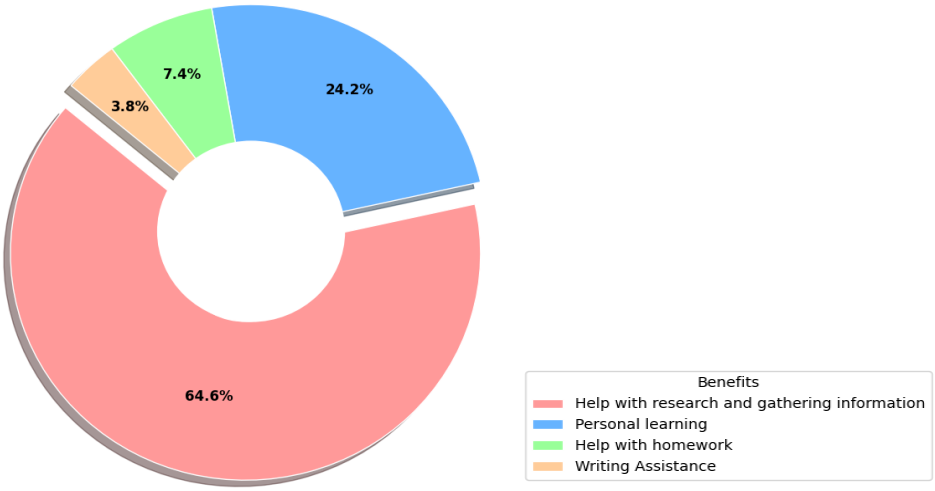

Figure 4. Perceived benefits of ChatGPT usage among participants

Examining students' familiarity with ChatGPT and its perceived benefits and drawbacks reveals several key insights. First, while students demonstrate a high awareness of the tool, many lack an understanding of its proper application across various educational activities. This finding aligns with Valova et al. (2024) [28], who also reported that although students had heard of ChatGPT, they lacked structured guidance on how

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to integrate it effectively in academic tasks. Similarly, Yuan et al. (2024) [29] noted that while students appreciated ChatGPT's support in writing, its pedagogical value was often misunderstood or underutilized. Additionally, our results show that computer science students are more familiar with ChatGPT than their peers in other disciplines, a pattern also observed by Woithe & Filipec (2023) [38], who attributed this to higher digital literacy among tech-savvy students. However, unlike their findings where usage was uniformly high, our study shows variation in actual usage frequency, suggesting contextual factors like internet access or curriculum emphasis may play a role (Abolkasim & Hasan, 2024) [42].

In terms of perceived benefits, students primarily viewed ChatGPT as a research aid, consistent with Baidoo-Anu & Owusu Ansah (2023) [34], who found that students used ChatGPT for summarization and idea generation. On the contrary, concerns about critical thinking erosion and academic dishonesty were emphasized more strongly in our study, echoing the concerns raised by Sullivan et al. (2023) [36] and Bergström et al. (2024) [37]. These differences might reflect institutional differences in AI policy enforcement or awareness programs.

Furthermore, when asked about the most effective strategies to improve their understanding and responsible use of tools like ChatGPT, 64% of students indicated that structured courses and workshops provided by the university would be most beneficial. Meanwhile, 36% believed that lecturers should take primary responsibility for teaching the appropriate use of such technologies, emphasizing the important role of educators in guiding students' AI literacy.

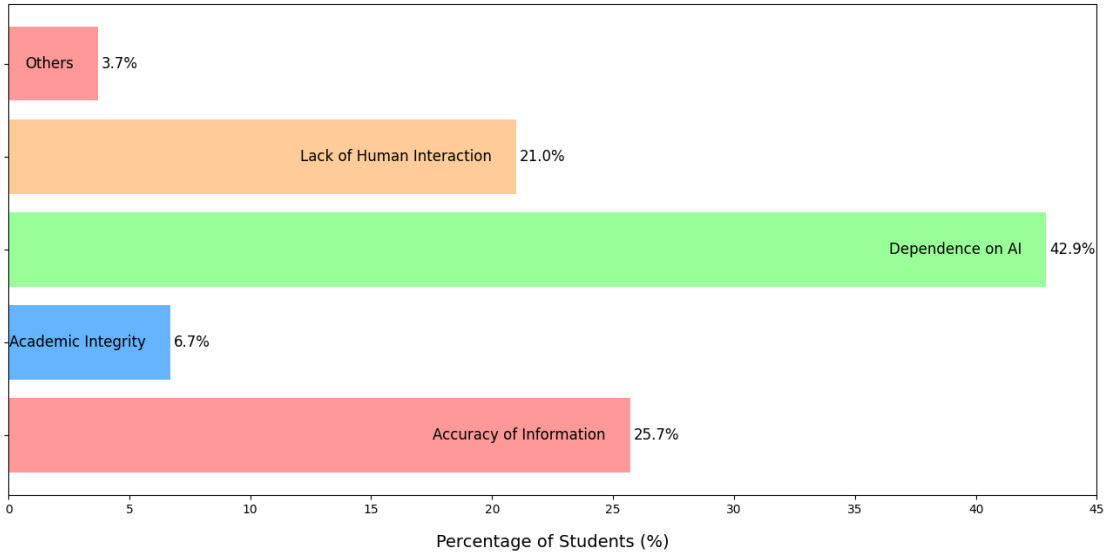

Figure 5. Concerns regarding the use of ChatGPT in education

Conclusion

This study assessed ChatGPT awareness, usage, and perceptions among University of Benghazi students. While many students are aware of ChatGPT, there is a notable lack of formal guidance on its use in education. Computer science students are more familiar with the tool compared to their peers in other disciplines. Several students recognize the benefits of ChatGPT, such as aiding research and providing personalized learning support. However, they also express concerns about over-reliance on AI, accuracy issues, reduced interactions with educators, and potential risks to academic integrity. The study highlights the need for universities to offer structured educational initiatives, such as workshops, and for educators to guide students on effective AI use. Addressing these gaps will help integrate AI tools like ChatGPT in a way that enhances learning while mitigating associated risks. Future research should focus on evaluating the impact of these educational strategies on AI literacy and student outcomes.

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