The Use of ChatGPT in Academic Writing by University Students in Jordan

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***Abstract*—The integration of Artificial Intelligence (AI) applications in education has become prominent recently. This study aims to investigate Jordanian students' acceptance of using ChatGPT in academic writing, focusing on the benefits and challenges of its use. Therefore, it relies on the Unified Theory of Acceptance and Use of Technology (UTAUT) model to investigate the factors that affect students' acceptance and use of ChatGPT. In addition, this study aims to focus on the concerns of using ChatGPT among university students. The study designs a questionnaire consisting of 17 statements about the advantages and disadvantages of using ChatGPT in academic writing. It was validated by three professors at Yarmouk University; the respondents to the questionnaire were 148 students specializing in English language and Translation at Yarmouk University, Jordan. The study found that performance expectancy, effort expectancy, facilitating conditions, social influence, and behavioral intention to use ChatGPT all contribute to the use of ChatGPT in academic writing by university students in Jordan. The study concluded that ChatGPT has more advantages than disadvantages in academic writing. However, strict guidelines, policies, or rules should regulate the use of ChatGPT in academic writing so as not to make students passive learners and affect their creativity.**

***Keywords*—ChatGPT, academic writing, Jordan, university students, advantages, disadvantages**

I. Introduction

Natural Language Processing (Henceforth, NLP), which has developed significantly over recent years, is a field that applies Artificial Intelligence to process and understand human speech or language. NLP is defined as "utilizing computer algorithms and statistical models to analyze and generate human speech and text" [1]. A popular example of NLP is ChatGPT, a Chat Generative Pre-Trained Transformer abbreviation. ChatGPT was released in 2022 and is trained on extensive corpora of texts, including books, web pages, and other information sources, which enables it to produce coherent textual responses given a user's prompt.

It can do many things, including writing any text, translating, and answering questions while responding as naturally as a human in conversations [1, 2]. Also, ChatGPT predicts the next word in a sentence based on the context of the previous words [3]. While the description of transformer blocks and sequence- to- sequence modeling is sufficient for general readers, it lacks details for readers with a technical background [4]. The architecture allows ChatGPT to be accurate and appropriate in its outputs, hence very strong in AI-driven communication and content generation.

The emergence of ChatGPT "has left people feeling ambivalent and disagreement among scholars, academicians, educators, and the community at large prevails" [5]. In other words, there is a great concern among academics that ChatGPT can be a form of plagiarism as it does not acknowledge the writer of the source text, and it may affect students' creativity as students tend to be over reliant on ChatGPT to perform their educational tasks. Therefore, there is an urgent need to set guidelines or provisions that regulate the ethical use of ChatGPT in writing. Authorship (plagiarism), bias (data), privacy and security (individual interaction's history), transparency (what testing and training data are used), and abuse (spread misinformation) are crucial ethical concerns about the use of ChatGPT because ChatGPT has the ability to generate human-like text [6]. They recommend that ethicists should collaborate with experts in fields, like legal, social, AI, engineering, science, economics, ethics, philosophy, and politics, to create ethical guidelines for the use of ChatGPT.

ChatGPT and other Large Language Models (LLMs) have several limitations such as:

- Hallucination: ChatGPT generated text that looks semantically or grammatically correct but actually unfaithful and meaningless.
- Originality: The sentence or main idea of the text generated by ChatGPT is a copy or combination of the training data.
- Toxicity: ChatGPT may produce harmful content which contain biased or discriminatory, or speech that is aggressive, insulting or misleading.
- Privacy: ChatGPT is trained on large-scale datasets and interacts with countless messages, which may lead to some privacy and security risks.
- Sustainability: The training and maintenance costs of ChatGP`T are high, including but not limited to cost in money, environmental and manpower, etc. [7].

Therefore, the users of ChatGPT should take these concerns into consideration when utilizing ChatGPT. They recommend that the design of technology should focus on human-centered principles that respect individual dignity and power. It is crucial to address risks related to privacy, copyright, and liability while ensuring data security to maintain user's trust. Ethical considerations must be included in the development processes, with guidelines for appropriate use and transparency. Avoiding uniform value judgments and preventing algorithmic bias are based on essential characteristics like race and gender. Artificial intelligence should aim to maximize benefits for all, with clear communication about its capabilities and limitations to guide positive development.

The ethical and practical integration of ChatGPT in higher education in Finland is investigated [8]. The study employs

an exploratory research approach as a theoretical framework. The study interviewed 12 Bachelor students of Business Administration, and they asked them about their opinions about integrating ChatGPT in higher education. The study found that ChatGPT can be used unethically by providing misconduct information, such as plagiarism. Therefore, university students should reasonably use ChatGPT, and they should understand its limitations. They also should avoid plagiarism, and ensure academic integrity.

ChatGPT is widely used in education nowadays. English language students use it to learn academic writing skills or to help them write their assignments, such as paragraphs, essays, projects, or research papers. However, using ChatGPT in writing assignments raises the question of credibility and confidentiality. That is, ChatGPT quotes from various sources without acknowledging those sources, and this may fall under the umbrella of plagiarism. Besides, some users have relied on ChatGPT when writing their assignments in general, which may affect their creativity. Some institutions worldwide do not allow students to use ChatGPT when writing university assignments, and there are some applications, such as iThenticate, Turnitin, etc., to detect whether this text was written by a human or by ChatGPT.

However, some students may use ChatGPT to learn basic writing skills, especially when they are trained alone. Teachers think ChatGPT can be helpful in education, and it does not affect human creativity. However, it teaches them how to think creatively, and it does not replace the instructors of writing "who teach their students that writing is about establishing relationships, which is something ChatGPT cannot do" [9]. Students can use ChatGPT to paraphrase, proofread, summarize, and generate ideas. Moreover, there are advantages of using ChatGPT, such as "saving time, getting immediate answers to various questions, writing for projects and homework, aiding in language learning, unified feedback, further learning material, and greater accessibility of information [10]. However, it has limitations such as "less critical thinking, only partial language capacity, incomplete knowledge of subjects, developing dependency on technology, misinformation, data privacy, and biased responses" [10].

NLP and ChatGPT have transformed educational practices globally. ChatGPT enhances the process of personal learning as students can ask about any information and get answers directly. In addition, it "facilitates interactive and inclusive learning environments, and improves curriculum development" [11]. Moreover, it creates diverse educational content and automates routine tasks, such as grading and material preparation. Also, it enables "teachers to dedicate more time to student-focused and interactive teaching practices. Additionally, its adaptability makes it a valuable resource across domains such as language acquisition, STEM education, and critical thinking development" [11].

In Jordan, specifically at Yarmouk University, there are two separate departments: the Department of English Language and Literature and the Department of Translation. In the study plan for both departments, students have two compulsory writing courses: paragraph writing and essay writing. As a requirement for these courses, students should write several academic essays and paragraphs on different topics to show their efficiency in academic writing.

The acceptance of ChatGPT in higher education, especially in writing, is important as it may help students enhance their writing skills. Different studies have been conducted on the potential benefits and risks associated with the use of ChatGPT in writing, such as plagiarism, incomplete and wrong information [10, 12, 13]. Therefore, several universities around the world have implemented specific regulations regarding the use of ChatGPT in academic work [13]. However, there is a gap in research concerning higher education students' acceptance of ChatGPT in academic writing in Jordan. This study aimed to examine the level of acceptance of ChatGPT among higher education students in Jordan, and identify the factors influencing their intention to use this tool. The motivation for the study stemmed from an ongoing academic debate primarily focused on the drawbacks of AI solutions in scientific work and the desire to address this gap by highlighting students' attitudes toward the use of ChatGPT. Therefore, this study attempts to answer the following questions:

1) To what extent Jordanian university students accept using ChatGPT in academic writing?
2) What are the ethical concerns about using ChatGPT in academic writing?
3) What are the practical solutions for the ethical concerns of using ChatGPT in academic writing?

After the COVID-19 pandemic, there was an urgent need to integrate technology in education to facilitate the teaching process in schools and universities while keeping students and teachers safe from the pandemic. Therefore, new technologies emerged, such as the invention of Artificial Intelligence (AI)-powered applications, such as ChatGPT. Both students and teachers started to use these technologies to facilitate and accelerate the learning process and get high results as these applications help them a lot do their assignments. The integration of AI-powered tools, such as ChatGPT in educational settings is examined [10]. The study focuses on teacher's satisfaction, effectiveness and challenges of using AI in education. The study used a survey consisting of open-ended and closed-ended questions and a questionnaire to collect the data. Three hundred participants took part in the study. The study concluded that two-thirds of the respondents were satisfied with integrating AI in education because it increases efficiency and enhances personal learning. In addition, the integration of AI in education is characterized by some concerns, such as bias and privacy. The study indicated that continuous training and transparency can handle these concerns to achieve teaching and learning educational goals.

The challenges of integrating ChatGPT in education is investigated and suggestions for the responsible and successful use of ChatGPT in teaching and research are provided [14]. He pointed out that some issues dispel fears about using ChatGPT in academic writing, such as the high-quality outputs that ChatGPT has produced and passed plagiarism detection software. In addition, AI content detectors, such as Turnitin can distinguish between AI and human writing. Moreover, ChatGPT is easily and globally accessible to anyone. Therefore, universities should adopt ChatGPT in education, learning, and assessment. However, universities should regulate and utilize these resources reasonably.

Furthermore, there should not be any worries about text generation since using ChatGPT in writing saves time and effort in creating texts of different types. He adds that "universities should not be concerned with the use of ChatGPT to generate, edit, or paraphrase texts as this does not assess students' learning and competencies in fields, such as computing, mathematics, art and design, medicine, or any other field" [14]. Students who join scientific colleges must have a minimum English language proficiency level to enroll in this program. Besides, there should not be fears about generating ideas using ChatGPT; using ChatGPT may help students cite the sources of information correctly. AI tools and human writing abilities should be integrated to produce higher-quality outputs with greater efficiency. ChatGPT can significantly improve the quality of creative and original writing when it is used in collaboration with human authors. While AI-generated text often lacks originality and can violate academic integrity, human authors may also struggle with efficiency and originality. ChatGPT's ability to quickly analyze vast amounts of published information can help humans identify existing ideas, ensuring their work is original allowing them to build upon previous research. This collaboration between AI and humans can accelerate learning and enhance human capabilities. Finally, instructors should teach students to acknowledge the source of information they use in their writing. Also, they should check their students' assignments using AI content detectors.

Moreover, the challenges and opportunities of using ChatGPT in education are investigated [12]. Therefore, they conducted a Strength, Weakness, Opportunity, Threat (SWOT) analysis of the usage of ChatGPT in education. They indicate that the strengths and opportunities of ChatGPT in education can be "generating plausible responses, self-improving capability, providing personalized responses, providing real-time responses (internal factors), increasing accessibility of information, facilitating personalized learning, facilitating complex learning, decreasing teaching workload (external factors)" [12]. In other words, ChatGPT can help students access information easily and teach themselves without teachers' help, i.e., personalized learning. However, it has some weaknesses and threats, such as "lack of deep understanding, difficulty in evaluating the quality of responses, the risks of biases and discrimination, lack of higher-order thinking skills (internal factors), lack of understanding the context, threatening academic integrity, perpetuating discrimination in education, democratization of plagiarism, declining in high-order cognitive skills (external factors)" [12]. All in all, students and teachers should be aware of using ChatGPT in education, and they should make sure that the use of ChatGPT will not affect the academic integrity by acknowledging the source of information and they should make sure that this usage should avoid biasedness and discrimination. In addition, students should not use it heavily in education to raise their cognitive skills.

Finally, teachers' acceptance of the usage of ChatGPT in higher education in Poland is also investigated [13]. They also explored the teachers' attitudes toward using ChatGPT, and the factors that affect the teachers' intention to use this toll in writing. The study prepared a web survey constructed on Google Docs, and disseminated to ten Polish universities. Th sample of the study consisted of 629 valid responses. In addition, the theoretical framework used in the study was the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model that was extended with the authors' Personal Innovativeness. The study provided support for academics in higher education institutions. It helps provide knowledge regarding the use of ChatGPT for developing educational materials, conducting scientific research, and writing texts. The study revealed that Habit (HT) and Performance Expectancy (PE) are the key factors influencing academics' (teachers and researchers) intentions to adopt and use ChatGPT.

II. Literature Review

The ethical and societal drawbacks of AI in K-12 educational contexts are investigated [15]. They indicated that there is an ethical concern about the algorithms that reflect their creators' values and bias. They explained that "Even though the bias is embedded into the algorithmic model with no explicit intention, we can see various gender and racial biases in different AI-based platforms" [15]. They focused on the issues of AI applications in K-12 settings such as privacy, surveillance, autonomy, bias, and discrimination. They recommended that K-12 teacher should have professional learning sessions on using AI in educational contexts and they should participate with other teachers creating the curriculum suggested resources and teaching strategies for students.

In addition, university students' perception of using ChatGPT for learning, such as advantages, challenges, and potential solutions is examined [16]. The study designed a questionnaire which was distributed to 200 students via an online survey, and 30 students participated in semi-structured interviews. The students indicated that ChatGPT as the following advantages: it saves time, provides information in various areas, provides personalized tutoring and feedback, and enhances ideas in writing. However, ChatGPT has some challenges such as it has a difficulty in evaluating the quality and trustworthiness of sources, it is unable to properly and accurately cite sources, and it does not have the ability to effectively substitute words and use idioms appropriately. To overcome these challenges, the study recommends that the learners should check the accuracy of ChatGPT's information by cross-referencing them with trustworthy sources. They should use ChatGPT as a tool for research, consultation, or idea generation, rather than a definitive authority. They also should create clear instructions and best practices for using ChatGPT effectively. Finally, they should highlight the importance of academic honesty to encourage the responsible and ethical integration of ChatGPT in educational settings.

The use of ChatGPT in academic writing is also examined, and the study provides perceptions on how to use it legally [17]. They surveyed 40 medical students in India, and the questionnaire consisted of ten questions each for knowledge, perception, attitude, and practice. ChatGPT is an innovative tool for academic writing; "it can increase efficiency and accuracy and assist writers in producing high-quality research papers" [17]. However, there were some potential risks associated with the use of ChatGPT in academic writing, and there should be some precautions to minimize these risks, such as maintaining "human judgment

and critical thinking in the writing process and using ChatGPT as a complementary tool rather than a replacement for human effort" [17]. ChatGPT should be used reasonably rather than excessively in academic writing so as not to affect humans' cognitive abilities.

A comprehensive guide for using ChatGPT in academic writing is introduced [18]. The study indicates that it can be a valuable tool for researchers who do not have enough experience in academic writing as it helps them in formulating the hypothesis and the questions of the study, writing the literature review, meta-analysis, research design, language translation, paraphrasing, summarizing ideas, editing, and proofreading. However, it is vital to recognize the limitations and ethical concerns of using ChatGPT in academic publications, including biased content and excessive dependence on AI models.

Another study investigates the students' views, experiences, and satisfaction of using ChatGPT as an AI-powered English Writing Assistant in Pakistan [19]. The study data was collected by a questionnaire to 150 active university students. The questionnaire used a five-point Likert scale with ten statements to measure how satisfied university students are with ChatGPT. The study used thematic analysis to analyze the data. The study found that students prefer to use ChatGPT in writing as it helps create content. Also, it provides students with flexible writing choices and styles.

An additional study provides an overview of Wordtune [20]. This AI-powered writing assistant helps English as a Foreign Language (EFL)writers formulate and translate their ideas and suggest options for rewriting them in different tones, such as causal, formal, etc. The study investigated the benefits and drawbacks of using this application in English writing for EFL. Wordtune improves EFL students' writing and helps them avoid difficult words and expressions in English. Therefore, it is a useful tool for enhancing EFL students' writing abilities in English, and it "maintains a continuous flow and learn useful ways to express their ideas in written English" [20]. It also provides EFL students with options to express their ideas more effectively in English. It facilitates idea formulation, translation, and overall writing improvement. However, Wordtune works only online, so the rewrite option may be less precise if the selected original text is difficult. Also, "On a list of rewrite options, the top choices are often more accurate than those on the bottom" [20].

ChatGPT cannot be avoided, and we should work on how to use it in academic writing "judiciously, cautiously, and responsibly to improve research performance by strictly adhering to academic integrity and transparency" [5]. There should be certain guidelines for using ChatGPT in academic writing to avoid its illegal uses.

There are some benefits of ChatGPT in academic writing, such as the increased research performance by saving the time and effort of writing the paper and shortening the time of its publication [5]. It can help researchers write the initial stages of writing the paper, such as producing an initial draft. It can support researchers with the necessary data, such as writing the methodology section, a study sample, and the analysis methods. However, there are some legal concerns relating to the use of ChatGPT. In other words, ChatGPT may quote from sources not acknowledged in the paper, which goes under the umbrella of plagiarism. In addition, it may affect the writers' skills in searching and making arguments themselves. Another drawback of ChatGPT is its biasedness in citing references, as it tends to rank references with high citations or principal theories while disregarding those with low citations [21].

A study investigates academic the parameters of honesty and plagiarism for 50 short essays generated by ChatGPT on different topics [22]. After that, two popular plagiarism detection tools, iThenticate and Turnitin, were used to check for plagiarism. They asked ChatGPT to confirm if these essays were written by themselves, which "showed superior performance compared to the traditional plagiarism-detection tools" [22]. They found that ChatGPT can write content on many topics professionally, and they revealed that 40 essays were detected as of high originality with a similarity score of 20% or less. Therefore, students may probably use ChatGPT to write essays without getting detected for plagiarism. Moreover, the topics of the detected essays were physics laws, data mining, global warming, machine learning, etc., and these topics are "considered to be factual in nature rather than interpretative" [22]. The topics of detected essays with minimum similarity "shifted from straightforward scientific descriptions to more contentious themes that necessitated interpretation, such as cultural differences, characteristics of a good teacher, and leadership" [22].

They suggested that plagiarism detection should "shift its focus from similarity check to verifying the origin of content" [22], and the plagiarism detection process should focus on verifying the content originality and a similarity check. Finally, they confirm that ChatGPT can be effectively used in education by both students and their tutors, particularly in academic writing. However, the tutors should inform their students about the limitations of ChatGPT and the negative consequences of relying on it. Also, tutors should "give assignments beyond the basics and foster active engagement and critical thinking" [22]. Moreover, they should consider academic integrity and ethical guidelines in academic writing. Finally, universities should have clear policies for using AI tools like ChatGPT in academic writing by offering students, faculty and staff training on academic integrity and the responsible application of AI tools in educational settings.

Finally, a study investigates Chinese college students' perceptions of ChatGPT in higher education [23]. The study focused on students' attention, interest and attitude. They surveyed 476 students from 67 universities and colleges in 17 provinces in China. The study finds that students have positive attitudes toward the use of ChatGPT as it has potential for innovative thinking, personalized learning, and writing analysis. However, ChatGPT has some drawbacks such as the accuracy of information it provides and the over-reliance of students on ChatGPT and this may affect their career development in the future.

III. Materials and Methods

A. Questionnaire Design

The main aim of the questionnaire is to survey the students' opinions, attitudes, and experiences toward using

ChatGPT in academic writing, and to see if it enhances their writing skills. Further, it aims to ensure that students are aware of the ethical use of ChatGPT in their writing assignments. The study conducted an online questionnaire as the primary instrument for using ChatGPT in academic writing assignments. The target students for this questionnaire were English language students and Translation students because they have two obligatory courses for academic writing in their study plans at Yarmouk University, namely paragraph writing and essay writing. An online questionnaire was used to offer a practical, easy, and efficient way of data collection, and the questionnaire was formatted and ensured standardized responses using a 5-point Likert scale to enhance the reliability and comparability of the gathered data. The questionnaire was designed using Google Forms. The questionnaire consisted of 25 statements divided into two sections: nine statements about the disadvantages of using ChatGPT in academic writing and 16 sentences about the advantages of ChatGPT in academic writing. This questionnaire was validated by three professors at Yarmouk University, who revised this questionnaire and suggested some points. This survey was posted for students of English language and translation on their group Facebook pages, and they were asked to fill it out online carefully.

B. Participants

This study is aimed at a widely representative sample of Bachelor students of English language and Translation at Yarmouk University. The questionnaire was posted on Facebook; it was posted on both the page of Translation Department and English Language and Literature Department. Only 148 students responded to the questionnaire. This sample is adequately representative, and it can ensure the adequacy of statistical analysis. This sample the students who have used ChatGPT in academic writing so far. The study employed random sampling technique to ensure that every individual has an equal chance of being selected. In addition, the demographic characteristics of the sample such as gender, year of study and specialization closely match those of the overall population of the study, and they enhance its representativeness. In addition, the number of respondents deemed significant reflecting students' perceptions about using ChatGPT in academic writing in Jordan.

C. Data Analysis

The quantitative data extracted from the questionnaire was analyzed using statistical techniques, namely, descriptive statistics and the SPSS statistical tool. Then, these responses were analyzed thematically by examining recurring themes and emerging patterns and their identification and coding to complement the quantitative findings.

D. Theoretical Framework

Due to the rapid developments in using technology, the acceptance of technology, especially in education, has become an essential issue. Therefore, the study employed the Unified Theory of Acceptance and Use of Technology (UTAUT) [24] (see Fig. 1). UTAUT is a model used to understand the adoption of technology in educational setting. According to model [24, "four constructs will play a significant role as direct determinants of user acceptance and usage behavior: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC)". In addition, the model has incorporated key moderators such as gender, age, voluntariness, and experience. To illustrate, PE represents the extent to which a person feels that utilizing the system will enhance their job performance. EE indicates how easy the system is to use. SI pertains to how much a person thinks that significant others believe they should adopt the new system. FC signifies the extent to which an individual believes that there is sufficient organizational and technical support for using the system [25]. UTAUT has been used as a theoretical framework in different studies related to the acceptance of technology in different settings such as the acceptance of e-banking, mobile applications, mobile payments, information systems, e-commerce, learning platforms, mobile learning, and educational chatbots [25]. They indicate that several key factors from the context provided emphasize the importance of performing a systematic review of UTAUT in higher education. First, the UTAUT model is widely applicable in different fields. Second, although many reviews have evaluated UTAUT's implementation, there is a notable lack of targeted research specifically in the higher education sector. Additionally, given the advanced state of research on UTAUT's use in education, where many participants come from higher education institutions, it is clear that a specialized review in this area is both timely and essential.

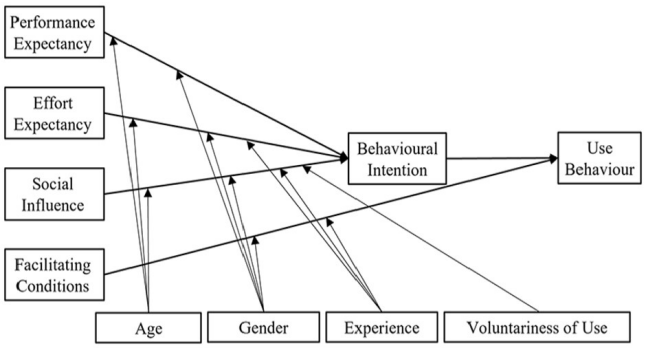

Fig. 1. UTAUT model (Venkatesh *et al*. 2003) [24].

IV. Result and Discussion

A. Demographic Information

Table 1. Demographic information about the participants of the study

Category	Subcategory	Number of Responses	Percentage
Gender	Male	27	12.2%
	Female	121	81.8%
Year of Study	First-year	7	4.7%
	Second year	42	28.4%
	Third year	37	25%
	Fourth	62	41.9%
Specialization	Translation	62	41.9%
	English Language	86	58.1%

Table 1 shows the relationship of demographic categories to using ChatGPT in academic writing describes various trends in education, gender, occupation, and specialization. The highest percentage of respondents was females, with 121 respondents, about 81.8%, as most students in both departments are females. The male students were 27, about 12.2%. The highest percentages of ChatGPT users were

students who were in their fourth academic year, with 62 students, about 41.9%. Those students seem to have experience using ChatGPT in academic writing because they have covered almost the majority of courses in their study plan. The second-year students ,42 students, account for about 28.4% of the younger generation's fondness for technology. After that, the third-year students, 37 students, about 25%, and lastly, the first-year students, about 7, with the lowest percentage, 4.7%. This is because they have studied at least one writing course, paragraph writing. Concerning specialization, the highest percentage was for English language students, with 86 students, about 58.1%, and about 62 translation students, with 41.9%. This is because one professor in the English language Department trained his students on employing ChatGPT in academic writing in one of his writing classes.

B. Advantages of ChatGPT

Table 2. Advantages of using ChatGPT in academic writing in Jordan

No.	Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	Performance Expectancy					
1	Using ChatGPT helps develop my writing skills.	14.2%	41.9%	23.6%	17.6%	2.7%
2	Using ChatGPT helps me develop my English grammar and increase my vocabulary.	22.3%	46.6%	16.2%	13.5%	1.4%
3	Using ChatGPT to get new ideas to help me in writing	39.2%	48%	10.1%	2%	7%
	Facilitating Conditions					
4	Using ChatGPT gave me confidence in my writing skills.	9.5%	36.5%	33.8%	17.6%	2.7%
5	Using ChatGPT in writing improves text cohesion and coherence.	13.5%	48.6%	26.4%	10.1%	1.4%
6	Using ChatGPT helped me write the text effectively.	16.9%	41.9%	25.7%	13.5%	2%
7	Using ChatGPT in writing increases my creativity.	20.9%	47.3%	20.9%	8.1%	2.7%
8	Using ChatGPT in writing helped raise my writing achievement.	17.6%	33.1%	23.6%	18.9%	6.8%
9	Using ChatGPT in writing has encouraged me to write paragraphs and essays on various topics.	21.6%	44.6%	17.6%	12.8%	3.4%
10	Using ChatGPT in writing helped me write an effective introduction to the article.	16.2%	43.2%	25%	12.8%	2.7%
11	Using ChatGPT in writing helped me understand the correct use of punctuation.	16.9%	45.9%	15.3%	18.2%	3.4%
	Social Influence					
12	I would recommend that other students use ChatGPT to teach writing.	20.9%	37.2%	25%	12.2%	4.7%
	Effort Expectancy					
13	It makes learning writing skills easy.	15.5%	45.5%	21.6%	16.2%	1.4%
14	It makes learning more fun.	15.5%	39.2%	26.4%	17.6%	1.4%
15	Using ChatGPT saves time	48%	34.5%	13.5%	2.7%	1.4%
	Behavioral Intention to use ChatGPT					
16	I intend to use ChatGPT academic writing in the future	37.2%	20.9%	25%	12.2%	4.7%
	Actual Use					
17	I prefer to use ChatGPT in academic writing	16.2%	28.4%	22.3%	19.6%	13.5%

1) Actual use

Table 2 shows that almost two-thirds of the students use ChatGPT in their academic writing assignments. About 44.6% of the students use it while performing their writing assignments. However, 22.3% did not reveal that they use ChatGPT in their academic writing assignments. This indicates that they use it but do not like to confess. Meanwhile, 33.1% of the students do not use ChatGPT in their academic writing assignments. More than a third of the students, about 38.6%, depend heavily on ChatGPT in their academic writing while 24.3% do not admit that they use it continuously in their writing assignment. On the other hand, 37.1% do not use it continuously in their academic writing.

2) Performance expectancy

Table 2 shows that more than half of the students, about 56.1%, confirm that using ChatGPT help them to enhance their writing skills, while 16.2% do not reveal this fact. However, 14.9% indicate that using ChatGPT does not develop their writing skills. Similarly, 68.9% confirm that using ChatGPT can help them develop their English grammar and increase their vocabulary. In addition, 16.2% show bias regarding this issue, and 14.9% do not think it can enhance their English grammar and increase their vocabulary. Most students, about 87.2%, explain that ChatGPT helps them get new ideas that help them in academic writing. While the answers of 10.1% of the students were neutral, and only 9% did not agree that ChatGPT can create ideas that may help them in academic writing.

3) Facilitating conditions

Regarding students' confidence of using ChatGPT, Table 2 shows that about 46% agree that it increases their confidence in their writing skills. At the same time, 33.8% were neutral about this issue. 20.3% do not agree that using ChatGPT may increase their confidence in their academic

writing skills. Regarding the improvement of text cohesion and coherence, 62.1% of the participants confirm that it helps students maintain text cohesion and coherence during the writing process. In contrast, 11.5% do not agree that it will help students maintain text cohesion and coherence. 26.4% of the students are not sure about this point.

Regarding the contribution of ChatGPT in writing an effective text, more than half of the students, Table 2 indicates that about 58.8%, confirm that ChatGPT provides an effective text, while 15.5% do not agree with this notion. As for the increase of creativity in academic writing, 68.2% of the students agree that ChatGPT in academic writing increases their creativity, while 10.8% do not agree that it can increase their creativity, and 20.9% of them show their bias.

About half of students,50.7%, show that using ChatGPT increases their academic achievements, while 17.6% are unsure. However, 25.7% do not agree that ChatGPT can increase students' achievements. Regarding the contribution of ChatGPT in helping students write paragraphs and essays on various topics, about two-thirds, 66.1%, show that it helps them write paragraphs and essays on different topics. However, 17.6% show their bias about this issue. Particularly, 16.2% of the students do not agree with this assumption.

Concerning the contribution of ChatGPT in helping students write an effective introduction for their essays, 59.4% reveal that ChatGPT helps them write an effective introduction for their essays, 25% are unsure of that, and 15.5% do not agree on that assumption. Regarding the fact that ChatGPT can enhance the student's ability to understand the correct usage of punctuation marks, about two-thirds, 62.8%, indicate that ChatGPT helps them use the correct punctuation marks. 15.3% are unsure about that, and 21.6% do not agree that it can teach them the correct usage of punctuation marks.

4) *Effort expectancy and social influence*

As for the students' tendency to recommend ChatGPT for their peers, Table 2 indicates that 58.1% highly recommend it for their students although 25% are neutral, and 16.9% do not recommend it. The majority of the students, 61%, indicate that ChatGPT makes learning skills easy, but 21.6% do not agree with that, and 17.6% do not think that it is easy to use ChatGPT. More than half of the students, 54.7%, believe that ChatGPT makes learning fun; 26.4% are neutral, and 19% do not agree. Moreover, the majority of the students, about 82.5%, think that ChatGPT saves time, 13.5% remaining neutral, and 4.1% disagreeing.

5) *Behavioral intention to use ChatGPT*

With regard to the behavioral intention to use ChatGPT in academic writing, more than the half of respondents, Table 2 shows that 58.1%, indicate that they intend to use ChatGPT in academic writing in the future.

C. *Disadvantages of Using ChatGPT*

Table 3. Disadvantages of using ChatGPT in Jordan

No.	Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	It cannot ensure the confidentiality of information.	7.4%	20.9%	43.9%	20.9%	6.8%
2	It makes the learner passive.	28.4%	38.5%	16.2%	14.2%	2.7%
3	It generates difficult texts to understand or contains grammatical or punctuation errors.	3.4%	18.2%	33.1%	34.5%	10.8%
4	It produces text that need to be proofread, corrected or edited, and this takes additional time and effort.	6.8%	39.9%	17.6%	28.4%	7.4%
5	Its usage limits my creativity in learning writing skills.	14.2%	32.4%	23.6%	25.7%	4.1%
6	Its usage is a kind of plagiarism.	14.9%	33.8%	24.3%	22.3%	4.7%
7	I make balance between my writing skills, and using ChatGPT.	29.7%	54.1%	10.8%	4.7%	0.7%
8	I rephrase the text provided by ChatGPT to avoid plagiarism.	29.7%	52%	10.8%	6.8%	0.7%
9	I rely heavily on ChatGPT to write assignments in English.	9.5%	29.1%	24.3%	21.6%	15.5%

Not only does ChatGPT have some advantages in academic writing, but it also has some disadvantages. Table 3 shows that more than a quarter of the students, about 28.3%, indicate that ChatGPT cannot ensure the confidentiality of its information as it may not acknowledge the sources it quotes from. The majority, about 64.8%, are neutral, but 27.7% disagree. In addition, about 66.9% of the students think that ChatGPT makes the learner passive, 16.2% are neutral, but 16.9% do not support this idea. Moreover, 21.6% show that the text generated by ChatGPT is difficult to understand or contains grammatical or punctuation errors, one third, about 33.1%, are neutral, but 45.3% disagree with this assumption.

Furthermore, Table 3 shows that 46.7% of the students indicate that they need to proofread, correct, or edit the text that ChatGPT produces, and this takes additional time and effort; 17.6% are neutral, while 35.8% disagree with this assumption. Besides, 46.6% indicate that using ChatGPT limits their creativity in learning writing skills, and 23.6% of them show biasedness. However, 29.8% disagree with this assumption. Moreover, Table 3 shows that 48.7% think that using ChatGPT in academic writing is a kind of plagiarism, and 24.3% are neutral, but 62.9% disagree that using ChatGPT is a kind of plagiarism. In addition, 83.8 indicated that they balanced their writing skills and using ChatGPT, and then they selected what was appropriate for their writing topic. At the same time, 10.8% did not reveal anything about this issue. However, 5.4% do not make a balance between their writing skills and using ChatGPT. About rephrasing the text generated by ChatGPT to avoid plagiarism, 81.7% confirm that they paraphrase the text generated by ChatGPT to avoid plagiarism. Specifically, 10.8% are neutral, and 7.5% do not paraphrase the text.

V. Conclusion

This study applied the UTAUT model to investigate the

factors that affect students' acceptance and use of ChatGPT in Academic writing. The study found that performance expectancy, effort expectancy, facilitating conditions, social influence, and behavioral intention to use ChatGPT all contribute to the use of ChatGPT in academic writing by university students in Jordan. It is clear that most students are using ChatGPT in academic wiring in Jordan; even those students whose responses were neutral do use it. In addition, there are more advantages to using ChatGPT in academic writing than disadvantages. The main advantages of using ChatGPT in academic writing are as follows: It helps develop students' writing skills, enhances their grammatical skills, and increases their vocabulary. It also helps students generate new ideas and thoughts about the intended topics, gives students confidence in their writing assignments, helps students in maintaining cohesion and coherence in the text, helps in producing effective text on various topics. This finding is in line with the findings of [26] that the use of ChatGPT proves to be effective in generating ideas and enhancing the effective writing. All of this, in turn, increases students' achievements in this course, teaches them the rules of punctuations, makes learning more fun, easy and economical.

On the other hand, ChatGPT has several drawbacks. The source of the information it provides is often unclear, raising concerns about confidentiality. There is also the risk of plagiarism, as ChatGPT may not properly attribute the sources of its information. Additionally, excessive reliance on ChatGPT can lead to students becoming passive learners and stifles their creativity in developing writing skills. Moreover, the texts generated by ChatGPT require proofreading, paraphrasing, and editing, which demands extra time and effort from students. Nonetheless, some students report finding a balance between honing their learning skills and using ChatGPT, while others rely heavily on it for completing their assignments. Undoubtedly, ChatGPT is useful and effective in academic writing as it generates and suggests ideas, thoughts, topics, outlines, and useful hints that may guide the students in forming a well-organized piece of writing. It helps students enhance their academic writing skills.

In addition, there are ethical concerns related to the use of ChatGPT in writing, such as plagiarism and academic integrity, as students may use this writing as their own. To address this concern, the educator should highlight certain guidelines for the sue of ChatGPT for students to follow and should highlight the importance of the originality and confidentiality of information used in writing. Another ethical concern is that ChatGPT may provide misinformation and bias. Therefore, teachers should learn their students certain critical thinking techniques to verify the truthfulness of the information provide by ChatGPT. However, the heavy reliance on ChatGPT limits students' creativity in thinking and generating ideas. As a result, they will become passive learners. To solve this problem, the teachers should design assignments or projects that require the use of ChatGPT to enhance students' abilities in writing rather than to replace human abilities. Therefore, they should carry regular assessment for their students' performance in writing. Furthermore, not all students have equal opportunity to access or use ChatGPT in education in general, and this may affect the process of students' assessment. So, the teachers should notify students about the strict guidelines of using ChatGPT, and they should be trained well, so they can distinguish what is written by students and what is written by ChatGPT. More importantly, teachers have a significant role in teaching students the efficient use of ChatGPT in writing to avoid plagiarism on one side and to enhance student's abilities and skills in academic writing. There should be clear-cut guidelines, policies, or rules for students who use ChatGPT in academic writing. In addition, there should be professional training sessions for both teachers and students on how to use ChatGPT effectively for educational purposes. Besides, teachers should encourage collaborative learning or team working among their students as this may limit the dependency on ChatGPT. In addition, teacher Finally, integrating AI applications in education is an urgent need nowadays as life changes rapidly, and academic institutions should keep up with the development. ChatGPT is a two-edge weapon in academic writing, so it should be used carefully.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

A.A.H. conducted the research; collected the data; Z.A. analyzed the data; R.A. wrote the literature review section; all authors had approved the final version.

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