

## **Graduate Students' Attitudes Toward the Use of Artificial Intelligence Applications- ChatGPT as a Model: A Field Study on a Sample of PhD Students at the Algerian Universities**

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### **Abstract:**

This study aims to explore the trends of graduate students to use artificial intelligence applications, focusing on the Chat GPT model, by conducting a field study to represent different students across the country. A learning tool was used as a data collection tool, and the descriptive analytical model was adopted. The data was also analyzed using the standard SPSS program. The study reached the following results:

There are positive trends among doctoral students towards using the Chat GPT application as one of the artificial intelligence applications at Algerian universities.

The degree of doctoral students' adoption of Chat GPT technology as one of the artificial intelligence applications in intermediate education.

There is an average degree of awareness among doctoral students of the advantages and disadvantages of the Chat GPT application in the learning process.

There are statistically significant differences in the use of Chat GPT technology as one of the artificial intelligence applications attributed to the gender variable in favor of females.

**Keywords:** Artificial Intelligence, Chat GPT

### **Introduction:**

In recent years, there has been a revolutionary transformation in the landscape of global knowledge, characterized by unprecedented acceleration across diverse fields, most notably technology. This rapid evolution has played a pivotal role in enhancing and developing various systems, with educational systems being

particularly transformed. The revolution extends beyond mere technological advancements; it encompasses fundamental shifts in the methods of knowledge production and dissemination. This paradigm shift has facilitated a departure from the traditional constraints of knowledge production and access, fostering an environment ripe for flexibility and originality.

Initially, knowledge production was predominantly a human endeavor, limited to traditional media like paper. However, with the advent of artificial intelligence (AI), a new era of knowledge production has emerged. Introduced by John McCarthy in 1955, AI was conceived as a computer system capable of executing human-like cognitive functions, including speech, thought, learning, and problem-solving.

AI is a broad concept, comprising a wide array of technologies and algorithms. The surge in computational methods and information processing has expedited the evolution of AI, enabling computers to emulate intelligent human behaviors such as reasoning and analytical thinking. (Thiti Jantakun, 2021)

Within the educational sector, AI methodologies and tools have increasingly been integrated into higher education institutions. The adoption of AI technology has catalyzed significant shifts in teaching methodologies, promoting the widespread use of blended teaching approaches. These innovative methods include AI-driven chatbots, mobile applications, and specific tools designed to enhance teaching effectiveness.

The practical deployment of these technologies aims to meld innovative solutions into smart learning environments, potentially augmenting learning effectiveness and enriching the educational journey (huseyin bicenneu, 2023) . Such advancements contribute to elevating the quality of education by enhancing communication skills, increasing student engagement with the global community, refining higher education curricula, fostering personalized learning experiences, establishing comprehensive e-learning systems, and managing both structured and unstructured data. These enhancements are crucial in boosting student participation, enrollment, funding, communication skills, personalized learning paths, and the effectiveness of e-learning systems.

Among the myriad AI applications, ChatGPT stands out as a significant innovation. This technology simulates human cognitive processes in thinking, data analysis, and interaction, facilitating conversations that mimic human

interactions through its programming and extensive training on diverse datasets. This capability allows for logical, rational conversations that can effectively provide information and respond to inquiries, positioning ChatGPT as a transformative tool in the realm of higher education, thereby sparking numerous academic and practical inquiries.

Since its introduction, ChatGPT has ignited debate and controversy among educational stakeholders. While some advocate for its potential to enhance and facilitate educational development, others perceive it as a conduit for academic dishonesty, potentially undermining the foundational values of integrity and honesty in education.

This concern is particularly acute given its capability to serve as a research tool for students, possibly deterring them from leveraging their intrinsic cognitive skills. Consequently, this research seeks to examine the actual utilization of ChatGPT technology among students, specifically addressing the following primary question:

**What are the attitudes of PhD students toward the use of the ChatGPT application as an AI technology at the Algerian university?**

This central query gives rise to several sub-questions:

- \_ What is the extent of PhD students' reliance on ChatGPT technology as an AI tool in their educational pursuits?
- \_ How aware are PhD students of the benefits and drawbacks of using the ChatGPT application in their learning processes?
- \_ Are there statistically significant differences in the use of ChatGPT technology attributed to gender differences among PhD students?

### **Study Objectives**

A scholarly investigation without clearly defined objectives is directionless. This study aims to elucidate the real-world application of AI technologies among PhD students at an Algerian university, explore their attitudes towards using ChatGPT, investigate potential gender-related differences in its utilization, and assess the overall impact of artificial intelligence on higher education.

## Study Concepts

- **Artificial Intelligence:**

Coined in 1956 by John McCarthy, subsequent to Alan Turing's pioneering work, the term "artificial intelligence" (AI) has significantly evolved. The modern definition encapsulates "computing systems capable of performing tasks that typically require human intelligence, such as learning, adapting, synthesizing, self-correcting, and utilizing data for complex processing " (Helen Crompton, 2023).

AI encompasses a broad spectrum, including machine learning and deep learning, which are pivotal in developing systems that emulate human intelligence (Sharawy, 2023).

- **ChatGPT:**

Representing a breakthrough in AI technology, ChatGPT facilitates natural and conversational interactions between humans and computers. The acronym 'GPT' stands for "Generative Pre-trained Transformers," a category of language models pioneered by AI researchers.

Known for its generative capabilities, ChatGPT can produce novel and contextually relevant responses based on user inputs, utilizing its foundation in the GPT architecture, a sophisticated deep learning model that employs neural transformer networks to generate text that closely mimics human-like discourse. (Valentini, 2023) This capability makes ChatGPT an invaluable tool in the domain of interactive communication and automated content generation.

It has been trained on a vast amount of textual data to learn patterns, language structures, and context, allowing it to generate coherent and contextually relevant responses. ChatGPT can be used in various applications, such as chatbots, virtual assistants, and other conversational AI systems to facilitate natural language interactions between machines and humans (R. Garrote Jurado).

Here are some features that contribute to the popularity of ChatGPT (Repanovici, 2023):

- Understanding of natural language, it has been trained on a vast array of diverse textual data, which aids in generating human-like responses.

- \_ Contextual understanding, it is designed to maintain context throughout a conversation.
- \_ Memory of previous messages, it can recall previous messages and refer back to them, allowing for more coherence and appropriateness in responses.
- \_ It can be used in a wide range of tasks, including providing information, translating languages, and creating creative content.

### Previous Studies

- **Study by Zouhaier Slimi (Slimi, 2023):** *The Impact of Artificial Intelligence on Higher Education: An Empirical Study*

Artificial Intelligence (AI) is increasingly garnering attention across various sectors, including higher education. This study delves into the multifaceted impacts of AI on higher education by scrutinizing its effects on teaching methodologies, learning environments, assessment procedures, ethical considerations, requisite skills, and future career prospects.

Employing a qualitative approach through a survey targeting higher education stakeholders, the research uncovers that institutions need to more comprehensively integrate AI into their frameworks to better prepare graduates for future job markets. AI is shown to potentially revolutionize education by tailoring teaching approaches to individual needs, enabling rapid feedback, and automating administrative functions. Furthermore, its utility in grading and assessments suggests a beneficial influence on the learning experience, fostering the acquisition of new competencies and knowledge.

- **Study by Khawlah M. Al-Tkayneh and others:** *The Advantages and Disadvantages of Using Artificial Intelligence in Education*

This research investigates the pros and cons of AI application in education, as perceived by students of Al Ain University. Utilizing a descriptive research design to align with the study's goals, a sample of 184 students from Al Ain City was selected through stratified random sampling. A questionnaire, administered via

Google Drive, elicited student views on how AI might enhance personal learning, manage large data volumes, and improve task efficiency.

Nonetheless, student opinions were mixed regarding AI's ability to regulate behavior, guide learning processes, enhance system effectiveness, offer feedback, minimize teacher dependency, and foster social interactions. Additionally, concerns were raised about potential job losses in traditional educational roles, the costs associated with AI implementation, programming flaws, and a perceived reduction in human interaction within learning environments.

- **Study by Mohammed Hamad Al-Atal and others:** *The Role of Artificial Intelligence in Education from the Perspective of Students at the College of Basic Education in Kuwait*

This study aims to assess the significance of AI technologies in education and the challenges of their implementation. A descriptive methodology was employed, involving 229 students studying computer teaching methods at the College of Basic Education.

The survey, which included 31 statements, revealed significant variances in perceptions of AI's importance in education based on the academic year. However, no differences were noted concerning the challenges in its use. The findings also highlighted gender and GPA as factors influencing the challenges encountered in using AI technologies in education, while affirming a consistent recognition of AI's relevance in the educational framework.

### **The Five Intellectual Schools of Thought on Artificial Intelligence**

In contemporary discourse, numerous think tanks and opinion institutions delve into the ramifications of artificial intelligence (AI) on various sectors, including education. Mark Neikrim has delineated five distinct intellectual perspectives on AI that demonstrate radical differences in their outlooks on technology's future (Tundra, 2-4 March, 2020):

- **Dystopians:**

Advocates of the Dystopian view predict a Darwinian evolutionary battle between humans and machines, with smart machines poised to emerge victorious. This

school of thought harbors a predominantly negative perception of AI and robotics. Dystopians foresee robots assuming control over repetitive and low-intelligence tasks currently performed by humans, while AI is expected to progressively take on roles requiring higher intelligence. This shift is anticipated to culminate in significant job displacements within the education sector over the long term.

- **Utopians:**

In stark contrast to the Dystopians, Utopians embrace a more optimistic view of AI, envisaging a new and brighter epoch for humanity where manual labor and cognitive tasks are predominantly managed by machines. This transition is believed to afford humans a significantly reduced workload and an enhanced quality of life. Utopians argue for a strategic emphasis on education and technological investment to mitigate the adverse effects on employment caused by these technological advancements.

- **Optimists:**

This school posits that the advent of technology has already ushered in enhancements in productivity, which continue to evolve as businesses learn to better harness these advancements. Optimists highlight the potential of smart technologies to further boost productivity levels across various industries.

- **Skeptics:**

Skeptics caution against equating productivity growth with broader economic gains such as profit increases or GDP growth, particularly in the context of an aging demographic and widening income disparities. They argue that improvements in productivity might not necessarily translate into economic benefits, advocating for greater transparency and tempering expectations of productivity growth, which could potentially lead to economic stagnation or decline relative to AI investments.

- **Realists:**

Maintaining an optimistic yet pragmatic stance, Realists acknowledge the evident boosts in productivity. They assert that companies strategically integrating AI into their operations are likely to witness substantial productivity gains. However, they also note the potential for a reshaping of the job market, with a probable decline

in middle-skill jobs but increases in both lower-skilled and high-skilled employment opportunities.

## **Benefits and Drawbacks of Using Artificial Intelligence in Higher Education:**

### **Benefits:**

- \_ Virtual reality can aid students in fostering collaboration and teamwork. Furthermore, artificial intelligence can be utilized to create educational programs, systems, and interactive virtual assistants. When it comes to the aspect of learning verification, AI can automate many time-consuming administrative tasks in teaching and learning.
- \_ Receiving quick and detailed feedback on student performance, providing personalized interventions based on individual student needs, and automatically adapting content and teaching methods to support individual performance can ensure a more personalized and effective educational experience. (Mureşan, 2023)
- \_ Personalized learning: AI can assess a student's level on a particular subject and adapt educational materials accordingly, making them more effective for the student. AI allows students to progress at their own pace, making learning more personalized and effective. With AI, educational materials can be automatically created and tailored to the student's level, allowing them to achieve better results in the subject. (Annuš, 2023)
- \_ AI has facilitated continuous learning and educational advancement for both students and teachers through the educational programs it provides.
- \_ Speeding up operations and automating them in a short time.
- \_ Quick responses to concerns.
- \_ Reducing costs from an educational institutional perspective.
- \_ Enhancing the learning experience for students at various levels.

### **Drawbacks:**

- \_ Job loss due to the elimination of the need for human hands, making robots the most suitable replacement in terms of performance and cost.
- \_ Cybersecurity risks as there are many concerns about hacking personal information and data by these technologies or by humans.
- \_ Increased dependency on AI technologies leading to intellectual stagnation.

- There is a risk that students may become heavily reliant on ChatGPT and other AI tools, which could lead to a lack of critical thinking skills and independence in learning. The lack of social interaction could also mean that excessive use of ChatGPT may lead to poor social skills and reduced empathy. Accuracy and bias. ChatGPT may generate incorrect or biased responses based on the data it was trained on. If students rely on ChatGPT without verifying the accuracy of its answers, they may be misled. (Velibor Božić)

### Detection of AI-Generated Content

To effectively identify content created using AI tools such as ChatGPT, a variety of methods can be implemented, including meticulous manual analysis. Mario Konecki outlines several approaches for detecting AI-generated works: (Mario Konecki, 2023)

- **Language Analysis:** AI-generated texts, such as those from chatbots, often display limited linguistic capabilities, characterized by repetitive phrasing, unusual or inconsistent language patterns. A detailed examination of the language used can reveal if the content was likely authored by a chatbot.
- **Verification of Sources and Citations:** AI tools generally lack the capability to conduct original research or generate new ideas. Consequently, a document that does not appropriately cite sources or include references may indicate it was produced by an automated program.
- **Study of Sources and References:** Thoroughly reviewing the sources and references cited in a document can assist in determining if the work is AI-generated, as AI typically relies heavily on existing material.
- **Authenticity Checks:** Since chatbots cannot create genuinely original content, works that closely mirror existing texts are likely produced by AI. Authenticity can be assessed through manual reviews or the use of plagiarism detection tools.
- **Factual Accuracy:** While AI can generate coherent text, it does not always ensure factual correctness. Scrutinizing the content for factual errors is crucial in assessing its origin.

- **Grammatical and Spelling Checks:** Human-written texts might contain typographical or grammatical errors, whereas AI-generated texts might appear flawless due to their programming. However, the presence of errors can vary based on the quality of the AI model and its training data.
- **Language Analysis Tools:** Tools designed specifically to detect AI-generated text, such as the GPT-2 output detector demo, analyze written work to identify linguistic patterns or anomalies indicative of AI production.

## **Methodology and Procedures of the Study**

- **Study Approach:**

The research utilized a descriptive analytical methodology, which aligns with the nature and objectives of the study, aiming to analyze and describe the phenomena observed without influencing or altering the environment.

- **Population and Sample:**

The study encompassed all PhD students at an Algerian university, with a sample comprising 196 participants selected randomly. This approach ensures a representative cross-section of the student body, enhancing the reliability and applicability of the findings.

- **Study Tool:**

An electronic questionnaire was employed as the primary research instrument. This method facilitated access to a broad demographic across various Algerian universities, enhancing the diversity of the sample and allowing for potential generalization of the results. The questionnaire included 30 statements designed to elicit comprehensive insights into the students' perceptions and experiences with AI in their educational pursuits.

## **Psychometric Characteristics of the Pilot Study:**

### **Validity:**

- **Content Validity:**

The results of the marginal comparison validity for the questionnaire are presented in Table 1:

**Table (1): Results Of the validity of the marginal comparison for the questionnaire:**

Categories	Number (n)	Mean	Standard Deviation	T-Value	Significance Level
Upper	66	70.0	1.64	27.54	0.07
Lower	66	38.85	9.04		

**Source:** Prepared by the researcher based on SPSS outputs.

It is noted that the mean score for the upper group was 70.0 with a standard deviation of 1.64, while the mean for the lower group was 38.85 with a standard deviation of 9.04. The table shows that there are no statistically significant differences in scores between the upper and lower categories, indicating the measure's ability to discriminate effectively between individuals.

### Reliability:

- **Cronbach's Alpha Method:**

The reliability of the questionnaire was evaluated using the Cronbach's Alpha method, with the results shown in the following table:

**Table (2): Results of the reliability coefficient of the questionnaire using Cronbach's alpha**

Tool	Number of Items	Cronbach's Alpha ( $\alpha$ )
Questionnaire	24	0.986

**Source:** Prepared by the researcher based on SPSS outputs.

The table indicates that the Cronbach's alpha coefficient was  $\alpha = 0.986$ , confirming an excellent and high level of reliability for the dimension.

### Presentation of Hypothesis Results:

1. There are positive attitudes among PhD students toward the use of ChatGPT as an AI application at the Algerian university.

**Table 3: One-sample t-test comparing the sample's mean to the normative mean**

Attitudes	N	Mean	Standard Deviation	T-test	Normative Mean	df	sig	$\alpha$	Significance
	196	56.40	14.49	54.49	48	195	0.00	0.05	Significant

**Source:** Prepared by the researcher based on SPSS outputs.

The table shows that the mean attitude score was 56.40 with a standard deviation of 14.49, while the T-value was 54.49 at 195 degrees of freedom, and the significance level was 0.00 at a 0.05 level. Since the significance value is less than the 0.05 threshold, this result is statistically significant.

The calculated mean exceeding the normative mean suggests that there is a prevailing positive attitude among PhD students toward the use of ChatGPT as an AI tool at the Algerian university.

This result reflects the students' recognition of the importance and necessity of embracing the field of artificial intelligence as a means to enhance knowledge acquisition, evidenced through services such as translation, research, and the generation of new ideas.

It also indicates a preference among students for modern scientific research methods that leverage technology, signifying a positive movement towards the digitization of the higher education sector and alignment with ongoing research and knowledge advancements in universities. The expanding range of services provided by ChatGPT technology, noted for its rapid access to information and the ease of transcending spatial and temporal boundaries, has become a pivotal resource for researchers.

- **Degree of Reliance by PhD Students on ChatGPT as an AI Technology in Education**

**Table 04: One-sample t-test comparing the sample mean to the normative mean**

N	Mean	Standard Deviation	T-test	df	sig	$\alpha$	Significance
196	17.22	4.77	50.54	195	0.00	0.05	Significant

**Source:** Prepared by the researcher based on SPSS outputs.

The analysis shows that the average reliance of PhD students on the ChatGPT technology is 17.22 with a standard deviation of 4.77. The T-value was calculated at 50.54 with 195 degrees of freedom, and a significance level of 0.00 at the 0.05 level. Given that the significance value is below the 0.05 threshold, this result is statistically significant. Since the mean falls within the moderate category range (16-24), it indicates a moderate degree of reliance by PhD students on ChatGPT as an AI application in education.

This moderate reliance suggests that while researchers utilize AI technologies, they maintain a cautious approach to avoid total dependency, which could result in intellectual stagnation. Ethical considerations also play a role in this measured reliance, as complete dependence on AI could diminish the personal touch and individuality inherent in scholarly research.

Additionally, given that ChatGPT may not always provide entirely accurate information, researchers must exert extra effort to verify its credibility; hence, some prefer sourcing information from original, primary sources. This approach also reflects a broader commitment among researchers to develop their intellectual capabilities through rigorous personal effort.

- **How aware are PhD students of the benefits and drawbacks of using the ChatGPT application in their learning processes?**

**Table 05: One-sample t-test comparing the sample mean to the normative mean:**

N	Mean	Standard Deviation	T-test	Df	Sig	$\alpha$	Significance
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196	19.93	4.46	62.48	195	0.00	0.05	Significant
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**Source:** Prepared by the researcher based on SPSS outputs.

From the data, the average awareness of PhD students about the advantages and disadvantages of Chat GPT is 19.93 with a standard deviation of 4.46. The T-value was 62.48 at 195 degrees of freedom, and the significance level was 0.00 at the 0.05 level. Since the significance value is less than the 0.05 level, this finding is statistically significant. The mean being within the moderate category range (16-24) suggests a moderate level of awareness among PhD students regarding the advantages and disadvantages of Chat GPT in the learning process.

These findings indicate that researchers possess a moderate understanding of the pros and cons of Chat GPT in the learning process. This could stem from a lack of deep familiarity with the services provided by AI and limited experience with AI, potentially due to the relatively recent introduction of this technology in higher education.

The need for targeted training courses on how to effectively use Chat GPT and a general reluctance toward embracing technology and digitization among some researchers might further limit their understanding of AI applications, which requires a robust and excellent grasp of technology and software.

- **Are there statistically significant differences in the use of ChatGPT technology attributed to gender differences among PhD students?**

**Table 06: Two-sample t-test for differences between the means based on gender.**

Gender	N	Mean	Standard Deviation	T-value	DF	Significance Level $\alpha$	Significance (Sig)	Difference Significance
Male	59	36.91	8.13	25.09	194	0.05	0.00	Not Significant
Female	138	64.60	6.54					

**Source:** Prepared by the researcher based on SPSS outputs.

The data reveals significant gender differences in the use of Chat GPT as an AI application. On average, males scored 36.91 with a standard deviation of 8.13,

while females scored notably higher at 64.60 with a standard deviation of 6.54. The T-value of 25.09 with 194 degrees of freedom and a significance level of 0.00 at the 0.05 threshold indicates statistically significant differences, with females showing greater usage of the technology.

### **Study Results:**

- \_ PhD students in Algeria exhibit positive attitudes towards using ChatGPT as an AI application within university settings.
- \_ The degree of reliance on ChatGPT among PhD students is moderate, reflecting its integration into their educational tools.
- \_ Awareness levels of the advantages and disadvantages associated with the ChatGPT application are also moderate among these students.
- \_ Statistically significant gender differences have been observed in the usage of ChatGPT, with female students showing greater engagement.

### **Conclusion**

The trend towards using AI technologies and software in the field of higher education has become one of the most prominent features of the knowledge society in the higher education field, and turning to it has become a necessity to keep pace with the developments imposed by globalization.

Through this study, we find that the attitudes of higher education students towards using artificial intelligence are positive, thus there are positive steps indicating that higher education students are keen to learn these technologies and software amidst their learning process to enhance their knowledge and performance levels. The researchers suggest a number of recommendations in this regard:

- \_ Promote the understanding and integration of artificial intelligence within educational frameworks.
- \_ Implement training courses to enhance the effective use of AI applications.
- \_ Develop comprehensive training programs aimed at equipping individuals in the educational sector with essential AI skills to meet future job market demands.

- \_ Establish ethical guidelines and legislations concerning the use of AI in education.
- \_ Initiate the inclusion of programming and smart application development courses early in educational curricula, particularly in IT studies, to foster innovation and creativity among students.

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