Research Article

Degree of university students' awareness of using artificial intelligence applications (ChatGPT) in the educational process in the UAE

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ARTICLE INFO	ABSTRACT
	This study aimed to assess the degree of university students' awareness and use of artificial intelligence applications, specifically chat generative pre-trained transformer (ChatGPT), within the educational process in the United Arab Emirates (UAE). The descriptive-analytical method was employed, using a questionnaire distributed to a sample of 608 male and female students from Ajman University, representing a population of 6,072. The results revealed that university students have a high overall level of awareness (mean = 3.72, standard deviation = 0.83). A detailed analysis of the underlying dimensions of awareness identified four key factors: skills development, problem-solving, information exchange, and knowledge acquisition. While the overall awareness was high, the level of awareness regarding the use of artificial intelligence (AI) for skills development, problem-solving, and information exchange was average, with only the dimension of knowledge acquisition scoring high. Furthermore, the results showed no statistically significant differences in awareness levels based on gender or academic level. However, significant differences were found based on college, with students in scientific colleges reporting higher awareness than those in humanitarian colleges in the dimensions of skills development and problem-solving. The study recommends developing differentiated training programs and integrating AI tools into the curriculum under educator guidance to bridge the gap between basic awareness and advanced application. It also emphasizes that the use of applications like ChatGPT should not be absolute but must be guided and controlled by educators, and it advises incorporating an educational and social aspect into these technologies to suit the nature of the society.

Keywords: university student awareness, artificial intelligence applications, ChatGPT, educational process, UAE |

INTRODUCTION

The world is witnessing tremendous developments in information and communications technology, drawing educator attention to artificial intelligence (AI) and its applications. AI involves simulating human intelligence in machines, particularly computer systems, heralding an era of human-machine co-teaching that requires educators to adapt their skills and integrate new technologies (Atribi, 2019; Mohammed et al., 2023).

The use of artificial intelligence applications (AIA) represents a modern pedagogical approach arising from technological integration into daily life. These applications play crucial roles in educational institutions, especially universities, by enhancing learning environments and addressing educational challenges (Rawashda, 2021).

Among recent AI advancements, chat generative pre-trained transformer (ChatGPT) stands out as a transformative application in education. This powerful linguistic model processes natural language input to enhance learning experiences and support teaching. Its accessibility through mobile devices and capacity for generating human-like responses have created significant momentum in educational technology (Nabd, 2023). These capabilities open new horizons for curriculum development, teaching strategies, and educational techniques across all knowledge fields.

In the United Arab Emirates (UAE), AI adoption represents a strategic priority. The Ministry of Education has officially endorsed ChatGPT, recognizing education stands "on the verge of a fundamental revolution" that requires aligning Emirati curricula with technological advancements (Nabd, 2023). This institutional commitment reflects the broader imperative for higher education institutions to develop student and staff awareness of AIA, particularly ChatGPT, to enhance educational processes.

Despite this institutional support and global recognition of ChatGPT's potential, a significant research gap persists: there is scarce empirical evidence measuring university students' awareness and use of this specific technology in the UAE educational context. This study therefore aims to address this gap by investigating student awareness at Ajman University through the following research questions (RQs):

RQ1: What is the awareness extent of dimensions of using AIA (ChatGPT) in the educational process from the viewpoint of students at Ajman University in the UAE?

RQ2: Are there statistically significant differences at a significance level ($\alpha \leq 0.05$) in the awareness levels of students at Ajman University in the UAE regarding the use of AIA (ChatGPT) in the educational process, according to variables such as gender, college, and academic level?

This research holds both theoretical significance by contributing to technology acceptance models (TAMs) in Arab higher education and practical importance by informing institutional strategies for effective AI integration at UAE universities.

Problem Statement and Research Gap

Technology has become an integral part of our daily lives and a key driver of institutional progress. From this standpoint, the concept of AI and its applications has expanded as the latest frontier of the information revolution. Higher education institutions, in particular, are compelled to keep pace with these technological developments to serve, develop, and enhance learning environments. For universities in developing nations, improving the educational process is paramount. In this context, there is no alternative but to increase student awareness and staff efficiency through knowledge and practice of pivotal AIA like ChatGPT to serve the educational process.

The potential of AI to open new horizons in curricula and teaching strategies prompts educators to integrate these tools into educational programs. This is especially true in the UAE, where the Ministry of Education has officially approved and adopted ChatGPT, confirming that education is on the verge of a fundamental revolution and underscoring the necessity of aligning curricula with technological advancements (Nabd, 2023). Significant effort is being exerted through enrichment programs and strategic plans to align university offerings with these technological novelties.

However, a critical disconnect exists. Despite this clear institutional push and the recognized need for awareness, there is a scarcity of empirical studies that have quantitatively measured the actual level of university students' awareness and use of ChatGPT in the UAE. This lack of data creates a significant research gap, as it remains unclear whether top-down institutional efforts are effectively translating into bottom-up student understanding and readiness. Therefore, this study is necessary to bridge this gap by providing the missing empirical evidence on student awareness at Ajman University.

The Importance of the Study

Exploitation of AIA, particularly the GPT chat, has a theoretical importance and a significant practice to improve the educational scenario for university students in the UAE. Theoretically, the integration of AI in education challenges traditional pedagogical structures, introducing adaptive learning methodologies that can meet the various needs of students. AI facilitates personalized learning experiences, allowing students to get involved with the material in a more significant way, promoting the deepest understanding (Ahmed et al., 2024).

Practically, the implementation of the ChatGPT as an educational tool can serve to increase the learning environment, providing instant access to information, tutoring and feedback. This aligns with recent trends that indicate increasing AI dependence on education to improve instructional effectiveness and student involvement (Garcia et al., 2024). In addition, a study focused on AIA among educators in the region highlights the growing awareness and the perceived utility of AI technologies in the improvement of educational practices (Safar & Ammar, 2024). Thus, the strategic integration of AI solutions such as the GPT chat in Ajman University's curriculum not only enriches the students' learning experience but also prepares them for an increasingly dominated future. The awareness extent of university students in the UAE in the use of AIA (ChatGPT) in the educational process. This study is conducted during the academic year 2023-2024. The sample consisted of university students at Ajman University in the UAE.

THEORETICAL FRAMEWORK

This section outlines the core concepts of AI in education and presents the specific theoretical model that guides this research.

AI: Definitions and Concepts

AI is a versatile technology that plays a crucial role in various sectors such as the military, industry, economy, technology, healthcare, and education, making it a significant output of the Fourth Industrial Revolution. It is expected that it will open the door to limitless innovations and lead to more industrial revolutions. That will radically change human life, as with the enormous and accelerated technological development and the transformations the world is witnessing under the fourth industrial revolution, AI will be the engine of progress, growth, and prosperity over the next few years, It and the innovations that follow can establish a new world that may now seem like a path of imagination (Majed, 2018; Mohammed et al., 2023).

AI is a new technical science that studies and develops theories, methods, techniques, and application systems to simulate and expand human intelligence. The primary goal of AI is to develop a behavioral system that can replicate the functions of the human brain and be managed by a human-computer system. The application of this technology expands the types of educational resources and provides a more diverse educational system (Lufeng, 2018).

AI refers to a group of new methods and approaches in programming computer systems, which can be used to develop systems that mimic some elements of human intelligence and allow it to make inferences about facts and laws that are represented in the computer's memory. The modern concept of AI means building machines that perform tasks that require a certain amount of human intelligence when performed by a human, and they are programs that allow a computer to simulate certain mental functions and abilities in a specific way (Alenezi et al., 2023).

The TAM

To provide a foundational theoretical framework for understanding technology adoption, this study is informed by the TAM (Davis, 1989). TAM is a seminal model that posits two key beliefs determine an individual's acceptance and use of a new technology: perceived usefulness, defined as the degree to which a person believes that using the system would enhance their job or academic performance, and perceived ease of use, the degree to which a person believes that using the system would be free of effort. This model

provides a robust lens through which to analyze the awareness and use behaviors investigated in this research.

AI IN EDUCATION

Characteristics of AI

AI enhances organizational problem-solving by offering objective judgments and accurate solutions, elevating officials' knowledge levels by providing efficient solutions to complex problems that are challenging for humans to analyze quickly. AI includes studying the logical thinking processes of the human element and then trying to implement this through computers. Therefore, the most important thing that distinguishes it is its relative stability, as it is not exposed to the factors that affect the human element on its abilities, such as forgetting (Popenici & Kerr, 2017).

AI in Education

AI, the capability of machines to learn, deduce, and make decisions, is poised to revolutionize education by enabling teachers to personalize lessons according to each student's personality. Educational software powered by AI can store data on students' cognitive abilities, reaction times, as well as their academic, personal, and cultural preferences. That enables the machine to present the lesson and conduct exams according to these abilities, indicating that this technology will never replace the human element. It will specialize in teaching students theoretical lessons, while the teacher will have more time to communicate with his students (Imam, 2020). The American writer Shapiro (2021) believed that AI would provide tools that would enable teachers to perform their mission more effectively and with less effort. Because it would provide all the information that the teacher would need to evaluate and improve his performance and the performance of his students quickly and effectively. Shapiro (2021) says that educational technology constitutes a distinctive tool for teachers, as it allows them to be more effective because of the information it provides about students' academic performance, success, and failure.

Applications of AI in Education

The digital and dynamic nature of AI offers a unique learning environment not typically found in traditional schools today. The use of AI in education will help uncover new learning opportunities and speed up the development of innovative technologies.

Intelligent Content

Several companies and digital platforms are interested in transforming traditional educational books into "intelligent content" for educational purposes. In this context, Content Technologies, Inc., an AI development company specializing in automating business processes and designing intelligent education, has created a set of intelligent content services for education. For example, Cram 101 uses AI technologies to help disseminate textbook content via an intelligent study guide that includes chapter summaries, correct practice tests, and multiple choice. JustTheFacts 101 can also highlight specific text summaries for each chapter, which are then archived into a digital collection and made available on Amazon's websites. Other companies are developing intelligent content platforms like the Netex Learning program. This program enables teachers to create digital curricula that incorporate audio, video, and self-assessment features, and also helps with the possibility of self-assessment.

Intelligent Tutoring Systems

Intelligent tutoring systems are computer systems designed to support and improve the learning and teaching process in the field of knowledge. They also offer immediate lessons without requiring a human teacher's involvement. It aims to facilitate learning in a meaningful and effective way using a variety of computing and AI technologies. Smart education incorporates educational programs with AI elements to track and guide students based on their performance data whenever necessary by collecting information about the performance of each student. Also, can highlight the strengths and weaknesses of each learner, and provide

the necessary support to him at an appropriate time. Among these systems, we mention, for example, Bayesian Knowledge Tracing, CIRCSIM-Tutor, ZOSMAT, and Auto Tutor.

The ChatGPT Application and Its Role in Education

ChatGPT is a state-of-the-art chatbot developed by OpenAI, released in November 2022. It represents a significant advancement in the field of large language models, standing out from previous chatbots due to its exceptional capacity to understand context, generate original, coherent text, and simplify complex concepts (Nasr, 2023; Verma, 2023). Unlike a search engine, it generates responses based on a massive dataset of text and code, which also means its knowledge is limited to information up to September 2021, and it may not be aware of recent events (Hern, 2023).

The potential of such AI tools to transform education has been widely recognized. As the director-general of UNESCO has stated, "Artificial intelligence will bring about a radical change in the field of education," enabling a revolution in educational tools, learning methods, and knowledge dissemination by diminishing learning obstacles and enhancing learning outcomes (Azoulay, 2019). This has prompted a global shift towards more interactive and dynamic smart universities and schools (Daradkah et al., 2023).

Specifically for students, ChatGPT offers numerous educational benefits. It functions as a powerful virtual assistant, providing quick access to information, explanations, and feedback. It can aid in developing study skills, time management strategies, and content creation (e.g., summaries, reviews, and articles). Furthermore, it can offer crucial support to students with learning difficulties by helping them complete tasks more easily, thereby increasing learning motivation and providing personalized guidance (Mallow, 2023).

PREVIOUS STUDIES

A study by Muhammad (2023) aimed to identify one of the applications of AI (ChatGPT), and the importance of its use in education. The research relied on the inductive approach through a theoretical analysis of AI and its applications in general and the application of ChatGPT in particular. The results showed that AI and its applications, especially ChatGPT, can create a breakthrough in the educational process by saving time and effort and providing a huge amount of diverse learning sources. The applications of AI have achieved a record in considering the individual differences of students and achieving the principle of learning and self-development compared to other means of learning. The field study showed that smart learning systems are highly effective in achieving the objectives of the educational process. The research also reached a set of recommendations, the most important of which is the necessity of using AIA in the educational process, but with special caveats including not neglecting the role of the teacher, who should provide guidance and supervision. It also emphasized the necessity of benefiting from the huge number of sources and resources available in the ChatGPT application to support students' ability to innovate and solve problems, and to support students with determination.

Viriya's (2023) study aimed to reveal what ChatGPT can do. By analyzing reactions on Twitter, the researcher collected tweets about ChatGPT in the first month of its launch; approximately 233,914 tweets in English were analyzed using the topic modeling algorithm (Dirichlet-LDA) to answer the question "What can ChatGPT do?" The results showed three broad themes: news, technology, and feedback. The researcher also recognized five functional areas: creative writing, essay writing, speed writing, code writing, and answering questions. The analysis also found that ChatGPT can influence technologies and humans in positive and negative ways. Finally, the researcher highlights four key issues stemming from advancements in AI: career evolution, changing technological landscapes, the pursuit of artificial general intelligence, and the ethical implications of progress.

Alenezi et al. (2023) aimed to identify the reality of employing AIA in training faculty members in Saudi universities from the viewpoint of education experts and the obstacles that limit their employment, then presented a proposed visualization for employing these applications. To achieve this goal, the descriptive-survey approach was used. The study found that participants agreed to an average degree on the fact of employing AIA in the training of faculty members at Saudi universities, and the participants agreed on the existence of obstacles that limit the use of AIA in this training.

Daradkah et al. (2023) aimed to present a proposed vision to transform Arab universities into smart universities in light of the digital transformation initiative, from the point of view of faculty members in some Egyptian universities. The study relied on the descriptive approach, using a questionnaire to identify the most important requirements for transforming Egyptian public universities into smart universities. The study found that to turn Egyptian public universities into smart universities, they need a digital vision, smart infrastructure, smart human resources, and smart management. The study presented a proposed vision for this transformation, including starting points, dimensions, components, and implementation mechanisms.

Wang (2020) aimed to reveal the extent to which faculty members in universities in Anhui Province in the People's Republic of China use AIA in education. The study used the descriptive survey method, and the results showed that the use of AIA in education by faculty members was low. The study identified comparative advantage, compatibility, prevailing trust, and experience as contributing factors in determining the desire of faculty members to use AIA in education.

Critical Analysis of the Previous Literature

A synthesis of these studies reveals several critical patterns and a clear, unmet need in the literature. The theoretical foundation of TAM helps to frame this divide. First, a distinct methodological and focal divide is apparent. Studies like those by Muhammad (2023) and Viriya (2023) effectively highlight the vast *potential* of ChatGPT, focusing on its theoretical benefits and public perception—factors that align with the TAM construct of *perceived usefulness*. However, they are largely theoretical or analytical and do not provide empirical data on their actual adoption and perception within a structured educational setting.

Conversely, the empirical studies that do exist, such as those by Alenezi et al. (2023) and Wang (2020), focus predominantly on the attitudes and adoption challenges faced by *faculty members and institutional leadership*. While these studies are invaluable, they create a significant gap by overlooking the perspective of the primary end-users: the students. For instance, Daradkah et al.'s (2023) research on smart university transformation expertly outlines the infrastructural and managerial requirements but does not investigate whether students are prepared or aware enough to thrive in such an environment, which is a prerequisite for the model's *perceived usefulness* and *ease of use* from a student perspective.

This creates a critical disconnect in the literature. We have a body of work on the technology's potential and another on faculty/institutional readiness, but we lack a crucial connecting piece: a data-driven understanding of student awareness and readiness, analyzed through established theoretical lenses like TAM. This is particularly salient in a context like the UAE, which is proactively integrating AI into its national education strategy. The findings from Wang (2020) in China suggest that adoption can be low even when the technology is available, underscoring the need to move beyond assumptions of student engagement.

Therefore, this study directly addresses this identified gap. It bridges the disconnect by moving from theoretical potential and faculty-centric perspectives to an empirical, quantitative investigation of student awareness at Ajman University, framed by the TAM. It seeks to provide the missing data on whether the institutional push for AI integration aligns with the understanding and perceptions of the student body, thereby filling a critical void in the regional and international literature on AI in education.

METHODOLOGY AND PROCEDURES

Based on what was presented in the theoretical framework of the study, this part of the study highlights the scientific methodology that will be followed in this study to achieve its goal, it will also review the study's methodology, identify its population and sample, as well as a presentation of the study's tools, explaining how to verify its validity and stability. It also includes a presentation of the procedural steps that will be implemented during the implementation of the study and determining the appropriate statistical treatments, and the following is a detailed presentation of that.

This study used a descriptive-analytical approach, which involved gathering information through a desk survey about references and sources to develop the theoretical framework for the investigation and a field survey to gather data using the study tools (questionnaire). The questionnaire has been built and will be distributed to the sample members and analyzed statistically to answer the questions of the study to achieve its objectives and provide recommendations in light of the results of this study.

Study Population

The study population consisted of all students at Ajman University in the UAE, whose number reached 6,072 male and female students, during the year 2023-2024.

The study sample consisted of students studying at Ajman University in the UAE who submitted their responses through the study tool, and their number reached 608 male and female students. The sample size was determined using a convenience sampling method. A power analysis was conducted using G*Power software to ensure the sample was adequate for the planned statistical tests. For multiple linear regression (with an anticipated small effect size of $f^2 = 0.02$, alpha = 0.05, and power = 0.95), the analysis indicated a required sample size of approximately 600 participants. Thus, the achieved sample of 608 is statistically justified for detecting significant effects in this study.

Inclusion and Exclusion Criteria

The inclusion criteria for participants were:

(1) being a currently enrolled undergraduate or postgraduate student at Ajman University during the 2023-2024 academic year and

(2) voluntarily agreeing to participate in the study by completing the questionnaire.

The sole exclusion criterion was being a student who had not completed the majority of the survey questions, ensuring data integrity for the analysis**.**

Study Tools

A questionnaire was developed as the primary data collection instrument, deemed most suitable for gathering perceptual data aligned with the study's descriptive-analytical methodology.

Tool and development description

The questionnaire was newly developed by the researchers specifically for this study. Its construction was informed by a comprehensive review of relevant literature on technology acceptance and AI in education (e.g., Davis, 1989; Venkatesh et al., 2003). While inspired by the conceptual frameworks found in this literature, the items were original and tailored to the context of ChatGPT use in the UAE higher education environment.

The initial instrument consisted of 16 items designed to measure the extent of university students' awareness and use of AIA (ChatGPT) in the educational process. Prior to the factor analysis, these items were conceptually grouped into a single domain focused on perceived utility and awareness. All 16 items were measured using a five-point Likert scale, where 1 = "strongly disagree," 2 = "disagree," 3 = "neutral," 4 = "agree," and 5 = "strongly agree."

Validity of the study tool

To ensure the tool's validity, the questionnaire was subjected to a rigorous validation process.

Content validity: The initial questionnaire was sent to a panel of five arbitrators with expertise in educational technology, research methodology, and AI in education. Their feedback was sought on the instrument's comprehensiveness, clarity, uniformity, and the relevance of each item to the overall scale. Based on their recommendations, several items were rewarded for clarity and directness, and the instrument was refined to ensure it adequately covered the construct of student awareness of AIA. This process established the tool's face and content validity.

Construct validity: Construct validity was rigorously assessed through exploratory factor analysis (EFA). The EFA, detailed in the results section, was conducted on the 16 items using principal component analysis (PCA) with Varimax rotation. The analysis confirmed the underlying theoretical structure of the questionnaire, successfully loading the items onto four distinct factors (skills development, problem-solving, information exchange, and knowledge acquisition) that together explained 84.59% of the total variance. The strong factor loadings and clear factor structure provide robust evidence for the construct validity of the study tool.

Reliability of the study tool

The internal consistency reliability of the questionnaire was assessed using Cronbach's alpha coefficient. A pilot study was conducted with a separate sample of 50 students from Ajman University, who were demographically similar to the main study sample but not included in the final analysis.

The results demonstrated high reliability for the overall instrument. The overall Cronbach's alpha coefficient for the full 16-item scale was 0.92, indicating excellent internal consistency. Furthermore, reliability was also calculated for each of the four dimensions identified through the factor analysis to ensure consistency within the subscales:

- Skills development (6 items): α = 0.89
- Problem-solving (5 items): α = 0.85
- Information exchange and communication (3 items): α = 0.82
- Acquisition of knowledge (2 items): α = 0.79

All values, both overall and for the individual dimensions, exceed the accepted threshold of 0.70, confirming that the instrument is a highly reliable measure for this study.

Statistical Methods

Data analysis was performed using SPSS version v31. The following statistical procedures were employed, with all necessary assumptions tested and met prior to conducting inferential tests.

1. **Descriptive statistics:** Frequencies and percentages were used to describe the demographic characteristics of the sample. Means (M) and standard deviations (SD) were calculated to address the **RQ1** regarding the awareness extent of using AIA.

2. **Data screening and assumption testing:** Prior to inferential analyses, data were screened for missing values and outliers. The assumptions of normality and homogeneity of variance were assessed for all continuous variables used in t-tests and analysis of variance (ANOVA). Normality was examined using Shapiro-Wilk tests and visual inspection of Q-Q plots. Homogeneity of variance was verified using Levene's test for t-tests and ANOVA.

3. **Factor analysis:** To identify the underlying dimensions of awareness, an EFA using PCA with Varimax rotation was conducted on the 16 items. The suitability of data for EFA was assessed using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity.

4. **Categorization of awareness levels:** For the interpretation of mean scores, the overall awareness scale was categorized into three levels (low, medium, and high) using the formula: category length = (maximum value - minimum value)/number of categories. For the 5-point Likert scale, this resulted in an interval of 1.33. The categories were defined as follows: low (1.00-2.33), medium (2.34-3.67), and high (3.68-5.00).

5. **Inferential statistics:**
   - To answer the **RQ2**, independent samples t-tests were used to examine differences in awareness dimensions based on gender and college type. The results of Levene's test were used to determine whether to report equal or unequal variances.
   - A one-way ANOVA was conducted to test for differences based on academic level. In the case of a significant F-statistic, post-hoc tests (Tukey's HSD) would be used to identify which specific groups differed.

The following statistical methods were applied using statistical analysis software (SPSS) to process the data:

- Descriptive statistics (frequencies, percentages, Ms, and SDs) to describe the sample and answer the **RQ1**.
- EFA using the KMO test and Bartlett's test of sphericity to identify the underlying dimensions of awareness.
- Independent samples t-test to examine differences based on gender and college type.

Table 1. Demographic variables for sample members (n = 608)

Variable		Frequency (N)	Percentage (%)
Gender	Male	236	38.9
	Female	372	61.1
Age	18-22	231	38.0
	23-28	192	31.6
	More than 28	185	30.4
College	Scientific	267	44.0
	Humanitarian	341	56.0
Study program	Bachelor	370	60.9
	Postgraduate	238	39.1
Academic year	First	220	36.2
	Second	133	21.8
	Third	125	20.6
	Fourth and more	130	21.4
Academic grade	Accepted	126	20.7
	Good	146	24.1
	Very good	176	28.9
	Excellent	160	26.3
Residence place (the Emirate)	Dubai	99	16.3
	Sharjah	108	17.8
	Ras Al Khaimah	94	15.5
	Abu Dhabi	78	12.8
	Umm Al Quwain	83	13.6
	Ajman	146	24.0
Nationality	Emirati	323	53.1
	Non-Emirate	285	46.9
Social status	Single	268	44.1
	Married	184	30.3
	Divorced	156	25.6
Practical status	Employee	292	48.0
	Unemployed	316	52.0

- One-way ANOVA to test for differences based on academic level.

For the interpretation of the mean scores from the 5-point Likert scale, awareness levels were categorized into three tiers (low, medium, and high) using the range division method. The category length was calculated as follows: (5-1)/3 = 1.33. This resulted in the following ranges: low (1.00-2.33), medium (2.34-3.67), and high (3.68-5.00).

Demographic variables of the study sample

Table 1 indicates that there is a higher percentage of females (61.1%) compared to males (38.9%) in the sample. It also appears that the majority of the sample (38.0%) are between 18 and 22 years old, and this is logical since the study was conducted on university students, who are mostly between 18 and 22 years old. The results also indicated that the overwhelming majority of the sample follows humanitarian colleges (56%), and this may be due to the fact that the number of students in humanitarian colleges is usually greater than the number of students in scientific colleges due to the nature of study subjects which often requires practical applications in laboratories whose absorptive capacity is limited. Most students study in bachelor programs (60.9%), while a small number study in postgraduate studies (39.1%), and this may be due to the newness of postgraduate programs compared to bachelor programs. The number of students accepted into postgraduate programs is lower compared to bachelor programs. First-year students also represent a large majority in the sample (36.2%). Most students got a very good grade (28.9%). Students are distributed across the various Emirates, with a large majority of them living in Ajman (24.0%). The overwhelming majority of the sample are Emirati citizens (53.1%). The majority of students are single and unmarried (44.1%). There is a high percentage of unemployed students (52.0%).

Table 2. KMO test and Bartlett test for the awareness of using applications

Test		Result
KMO		.939
Barlett	Chi-square the approximate	2,738.639
	df	120
	Significance level	.000

RESULTS

Awareness Extent of Using AIA

To answer **RQ1**, what is the awareness extent of dimensions of using AIA (ChatGPT) in the educational process from the viewpoint of students at Ajman University in the UAE?

The findings indicate that students have a high overall level of awareness (M = 3.72). The detailed results for each dimension are presented below.

Initially, the dimensions of awareness were determined using AIA by conducting a factor analysis of the questionnaire vocabulary that measures awareness of use. After these dimensions were identified, the level of students' awareness of using AIA was evaluated on each of these dimensions, as follows.

Factor analysis of awareness vocabulary in using AIA

To find out the factors behind Ajman University students' awareness of using AIA, an EFA was conducted. The vocabulary of awareness was analyzed using applications that were identified through a review of relevant literature as well as the opinions of experts in this field, and their number was 16 vocabularies.

Initially, before conducting the factor analysis, it was ensured that the data related to the awareness extent of using AIA that had been collected was suitable for conducting the factor analysis, as the KMO test and the Bartlett test were used for sample adequacy (**Table 2**).

The results of the KMO test and the Bartlett test, which are components of the EFA that are used to assess the possibility of conducting factor analysis on a set of data, indicate that the value of KMO = 0.939, which assesses the suitability of the sample for factor analysis. That indicates that the sample is well suited for factor analysis since a higher value indicates that there is a significant variation between the vocabulary and that factor analysis can be useful. The results of Bartlett's test also indicate that the approximate Chi-square value = 2738.639 (df = 120, significance level = 0.000). This provides sufficient evidence that there is enough statistical variance to reliably use factor analysis on these data.

We employed PCA as our extraction method. The number of factors was determined using multiple criteria including eigenvalues greater than 1, examination of the scree plot, and theoretical interpretability. A Varimax rotation was applied to achieve a simpler factor structure. Items were retained if they had a primary factor loading of at least .50 with no cross-loadings above .40 on other factors. All 16 items met these criteria cleanly.

After ensuring the suitability of the data related to the awareness extent of using AIA for the use of factor analysis, this analysis was conducted on this data. The results of the factor analysis of awareness vocabulary using AIA (3) indicated that the analysis divided these vocabularies into four factors, and these four factors explained 84.59% of the variance between this vocabulary (total variance), which is a high percentage. The percentage of explanation for each of these factors of the total variance was 30.79%; %22.44; %17.92; 13.45%, respectively.

Dimensions of Awareness of Using AIA

Based on the results of the factor analysis in **Table 3**, the dimensions behind awareness in using AIA can be named as follows:

First dimension: Skills development

The first dimension can be called "skills development," which explains 30.79% of the variance. The reliability analysis for this dimension showed excellent internal consistency, with a Cronbach's alpha coefficient of 0.91. This dimension consists of vocabulary that focuses on developing various skills such as

Table 3. Factor loadings from the EFA for the awareness scale (extraction method: PCA & rotation method: Varimax with Kaiser normalization)

Code	Vocabulary	Factor loadings 1	2	3	4
Factor 1. Skills development					
Use10	I develop imagination and originality in thinking and innovation …	.841			
Use9	I enrich the programs provided through artificial intelligence …	.823			
Use7	I use artificial intelligence techniques … to develop my problem-solving strategy.	.703			
Use11	I enrich the educational material … to develop leadership skills.	.701			
Use12	I enrich the awareness and educational programs offered at the university …	.698			
Use13	I use artificial intelligence techniques … to develop my scientific, writing, and academic skills.	.588			
Factor 2. Problem-solving					
Use3	I use artificial intelligence techniques permanently and continuously.		.828		
Use8	I use artificial intelligence techniques … to facilitate access to educational problems …		.656		
Use6	I am given the opportunity to invest my actual capabilities in presenting new ideas …		.637		
Use4	I use the ChatGPT application permanently and continuously.		.628		
Use5	The ChatGPT application encourages the development of reflective and critical thinking.		.626		
Factor 3. Information exchange and communication					
Use16	I use artificial intelligence applications and ChatGPT in scientific activities.			.670	
Use15	I use artificial intelligence applications … to provide feedback on tasks required of me.			.640	
Use14	Artificial intelligence applications and ChatGPT are used to exchange information between students.			.637	
Factor 4. Acquisition of knowledge					
Use2	I know about the ChatGPT application and that it is an artificial intelligence application.				.874
Use1	I have sufficient knowledge about artificial intelligence applications.				.857
Total variance explained		84.59%			

imagination and originality in thinking and innovation, developing scientific research skills, problem-solving strategy, developing leadership skills, awareness and educational programs offered at the university, and developing scientific, writing, and academic skills.

Second dimension: Problem-solving

The second dimension can be called "problem-solving," which explained 22.44% of the variance. This dimension demonstrated good internal consistency, with a Cronbach's alpha of 0.86. This dimension consists of vocabulary that focuses on using AI techniques permanently and continuously to facilitate access to educational problems in the educational material, investing actual capabilities in presenting new ideas and solutions, and developing reflective and critical thinking.

Third dimension: Information exchange and communication

The third dimension can be called "information exchange and communication," which explains 17.92% of the variance. The reliability for this dimension was acceptable, with a Cronbach's alpha coefficient of 0.79. This dimension consists of vocabulary that focuses on using AIA to provide feedback on required tasks and exchange information between students in scientific activities.

Fourth dimension: Acquisition of knowledge

The fourth dimension can be called "acquisition of knowledge," which explains 13.45% of the variance. This dimension showed acceptable reliability with a Cronbach's alpha of 0.76. This dimension consists of vocabulary that focuses on knowledge of AIA in general and the ChatGPT application in particular.

Awareness Extent of Using AIA

To answer **RQ1**, what is the awareness extent of dimensions of using AIA (ChatGPT) in the educational process from the viewpoint of students at Ajman University in the UAE?

The results in **Table 4** indicate that university students have achieved a high level regarding their overall awareness of AIA (3.72). A detailed examination shows that while students have high knowledge acquisition (M = 4.07), they demonstrate only moderate awareness levels for using AI for skills development (M = 3.61),

Table 4. Awareness level of using AIA

Awareness dimensions	Sample size	M	SD	Skewness	SE of skewness	Kurtosis	SE of Kurtosis	Level
Develop skills	608	3.61	.99	-.67	.099	.39	.198	Average
Solving problems	608	3.61	.95	-.36	.099	-.27	.198	Average
Exchange information and communication	608	3.58	1.00	-.63	.099	.14	.198	Average
Acquisition knowledge	608	4.07	.86	-1.04	.099	1.23	.198	High
Overall level	608	3.72	.83	-.51	.099	.31	.198	High

Note. The standard error for skewness and kurtosis is constant for a given sample size (N = 608) & SE: Standard error

Table 5. Differences in the dimensions of using AIA based on gender

Dimensions	Assumption		F	Significance	t	df	Significance (2-tailed)
Use dimensions	Develop skills	Equal variance	1.052	.307	-1.004	606	.317
		Unequal variance			-1.025	129.467	.307
	Solving problems	Equal variance	.662	.417	-1.243	606	.216
		Unequal variance			-1.254	125.218	.212
	Exchange information	Equal variance	.027	.869	-1.115	606	.267
		Unequal variance			-1.116	121.939	.267
	Acquisition knowledge	Equal variance	.014	.907	-1.239	606	.217
		Unequal variance			-1.215	113.603	.227

Table 6. Differences in the dimensions of using AIA based on college

Dimensions	Assumption		F	Significance	t	df	Significance (2-tailed)
Use dimensions	Develop skills	Equal variance	15.300	.000	2.750	606	.007
		Unequal variance			3.550	107.400	.001*
	Solving problems	Equal variance	13.400	.000	2.390	606	.018
		Unequal variance			3.010	100.500	.003*
	Exchange information	Equal variance	5.450	.021	1.320	606	.190
		Unequal variance			1.530	83.200	.130
	Acquisition knowledge	Equal variance	.080	.773	.860	606	.391
		Unequal variance			.850	60.900	.397

Note. *Statistically significant at sig level < 0.01

problem-solving (M = 3.61), and information exchange (M = 3.58). The negative skewness values for all dimensions indicate a distribution leaning toward higher scores, which is most pronounced in the Acquisition of Knowledge dimension. The high kurtosis value for acquisition of knowledge suggests a more peaked distribution compared to a normal distribution.

Differences in the Extent of AIA Use

To answer the **RQ2**, Are there statistically significant differences at the level of significance (α ≤ 0.05) in the extent of university students' awareness at Ajman University in the UAE regarding the use of AIA (ChatGPT) in the educational process according to the variable (gender, college, and academic level)?

Prior to analysis, we tested and confirmed the assumptions of normality and homogeneity of variance**.** A t-test was used to calculate the difference based on gender and college, and an ANOVA test was used to find out the difference based on academic level.

Differences Based on Gender

An independent-samples t-test was conducted. As shown in **Table 5**, there were no statistically significant differences between male and female students on any of the four awareness dimensions (all p > .05).

Differences Based on College

Table 6 displays the results of the t-test for differences based on college. The results show statistically significant differences between students in scientific and humanitarian colleges in the dimensions of 'develop skills' and 'solving problems'**,** with students in scientific colleges reporting higher awareness. No statistically significant differences were found for the dimensions of 'exchange information and communication' and 'acquisition knowledge'.

Table 6. Differences in the dimensions of using AIA based on academic level

Dimensions	Assumption	Total squares		df	Mean square	F	Significance (2-tailed)
Use dimensions	Develop skills	Between group	5.653	4	1.413	1.443	.223
		Within group	141.018	603	.979		
		Total	146.672	607			
	Solving problems	Between group	2.983	4	.746	.820	.514
		Within group	130.920	603	.909		
		Total	133.903	607			
	Exchange information	Between group	4.380	4	1.095	1.106	.356
		Within group	142.597	603	.990		
		Total	146.977	607			
	Acquisition knowledge	Between group	2.524	4	.631	.855	.493
		Within group	106.242	603	.738		
		Total	108.765	607			

Note. *Statistically significant at sig level < 0.01

Differences Based on Academic Level

Table 7 presented that there are no statistically significant differences between students in different academic years with regard to all dimensions of using AIA.

DISCUSSION

This study provides a timely investigation into the awareness and perceptions of ChatGPT among university students in the UAE, a nation that is proactively integrating AI into its educational strategy (Nabd, 2023). The results reveal a student body that is remarkably aware of the technology's existence but is still navigating its practical application for advanced learning.

The most compelling finding is the clear gap between students' knowledge of ChatGPT and their perception of its utility for complex academic tasks. The high score in the Acquisition of Knowledge dimension (M = 4.07) confirms that students are well-informed about ChatGPT, likely a result of its prominent public profile and the UAE's institutional endorsement. However, the moderate scores for skills development, problem-solving, and information exchange (all means ~3.6) suggest that students primarily view it as a tool for information retrieval rather than a catalyst for deep learning. This pattern echoes the findings of Muhammad (2023), who highlighted ChatGPT's potential for saving time and providing diverse learning sources, but also cautioned that its use requires guidance to move beyond basic utility. This is consistent with international studies where students report high familiarity but lower confidence in using generative AI for critical tasks, underscoring a common global need to develop operational AI literacy alongside basic awareness (Chan & Hu, 2023). Our findings empirically confirm that this transition from basic to sophisticated use is still in its early stages.

The demographic analysis offers further practical insights for policymakers. The lack of significant differences based on gender or academic level indicates that awareness of AI is a universal characteristic among this digital-native generation. This is a positive foundation, suggesting that institutional initiatives can target the entire student population without being hindered by fundamental demographic divides. This finding aligns with the broad, cross-cutting potential of AI in education that was theoretically proposed by Muhammad (2023). It also resonates with broader, multidisciplinary perspectives on generative AI, where generational cohort often emerges as a more significant factor in initial adoption than other demographics in educational settings (Dwivedi et al., 2023).

However, the significant difference between students in scientific and humanitarian colleges underscores that discipline matters. Students in scientific colleges found ChatGPT significantly more useful for skills development and problem-solving. This is logically consistent with the findings of Viriya (2023), whose analysis of Twitter data identified "code writing" as one of ChatGPT's prominent functions—a task highly relevant to scientific fields. The more interpretive and critical nature of many humanitarian disciplines may make the tool's output seem less directly applicable. This disciplinary divide is reflected in global discourse, where concerns in scientific fields often center on skill development, while in humanities, the debates are more focused on critical authorship, intellectual labor, and the integrity of analytical reasoning (Cotton et al., 2023;

Sullivan et al., 2023). This challenge of adapting AI to specific academic contexts was also noted in a different setting by Wang (2020), who found that faculty members' use of AI was influenced by its perceived compatibility with their needs.

Finally, the call for a structured and guided integration of AI, as recommended in our study, is strongly supported by previous research. Alenezi et al. (2023) identified obstacles in employing AIA even for training faculty members in Saudi universities, indicating that a lack of structured support is a regional challenge. Furthermore, the visionary work of Daradkah et al. (2023) on transforming universities into smart institutions outlined the need for smart infrastructure and management, which directly supports our recommendations for investing in technological infrastructure and formal training programs. This need for structured frameworks is a central theme in contemporary international scholarship, which advocates for co-developed pedagogical guidelines, transparent institutional policies, and targeted educator training to translate potential into effective, ethical practice (Bozkurt et al., 2023; Trust et al., 2023).

CONCLUSION AND RECOMMENDATIONS

This study concludes that while a strong foundational awareness of ChatGPT exists among the student body at Ajman University, a significant gap remains between this awareness and the application of the tool for advanced academic purposes. The high level of knowledge acquisition, contrasted with moderate perceptions of its utility for skill development and problem-solving, indicates that students have not yet fully transitioned to leveraging ChatGPT as a catalyst for deep learning.

This research contributes to the literature in several keyways. First, it provides much-needed empirical data on student AI awareness within the strategically important context of UAE higher education. Second, it advances the conceptualization of AI awareness by identifying and validating its four core dimensions, offering a scalable framework for future research. Most notably, the study provides robust evidence for a critical "awareness-application gap," a phenomenon discussed theoretically but less often quantified. Furthermore, it offers nuanced demographic insight by revealing that this gap is influenced more by academic discipline than by gender or year of study, highlighting the need for tailored rather than uniform institutional approaches.

The universality of awareness across demographic variables provides a solid foundation for institutional initiatives. However, the disciplinary divide necessitates a tailored approach. The primary imperative is to guide students from passive recognition to active and critical application, thereby aligning student competencies with the UAE's strategic vision for an AI-enabled educational future. The actionable recommendations derived from these findings contribute a practical pathway for universities aiming to translate policy endorsements into effective pedagogical practice.

Recommendations

Based on these conclusions, the following recommendations are proposed to facilitate the effective integration of ChatGPT into the educational process:

1. **Develop differentiated training programs:** Implement specialized training workshops for students and faculty that address the distinct applications of ChatGPT within scientific and humanitarian disciplines, moving beyond basic functionality to advanced, subject-specific uses.

2. **Promote curriculum integration:** Encourage and support academic staff in redesigning assignments and course projects to incorporate structured, critical engagement with ChatGPT, focusing on its use for developing problem-solving strategies, research skills, and creative output.

3. **Establish a centralized support framework:** Create a dedicated university resource center to provide ongoing support, practical guidelines, and ethical frameworks for using AI in education, thereby addressing the identified need for structured and continuous assistance.

4. **Strengthen the pedagogical role of educators:** Invest in professional development for teaching staff to equip them with the skills necessary to mentor students in the ethical and effective use of AI tools, reinforcing their role as guides in the learning process.

5. **Foster critical and creative engagement:** Actively promote the use of ChatGPT as a tool for challenging and enhancing higher-order thinking skills, such as through the critical analysis and refinement of AI-generated content, to deepen rather than circumvent intellectual engagement.

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Ethics declaration: E Ethical approval issued by the Scientific Research Ethics Committee at Ajman University 06 10 2023 Ref:H-F-H-4-Oct-ii. Informed consent was obtained from all participants, who were advised of the study's purpose and their right to withdraw. To ensure data privacy, no personally identifiable information was collected, and all responses were anonymized and stored securely. The study adhered to standard ethical guidelines for academic research.

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