Research Article

Section: Digital Humanities

The students' awareness degree of the effectiveness of artificial intelligence applications in learning the Arabic language

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Abstract

This study aimed to identify the degree of students' awareness of the effectiveness of artificial intelligence (AI) applications in learning the Arabic language, as students' viewpoints can provide valuable insights into directing and modifying their behavior towards learning Arabic through their awareness of AI applications' effectiveness. Data for this study were gathered by the researchers using a questionnaire and a descriptive approach. The study population consisted of 286 male and female students, while the study sample consisted of 175 male and female students, randomly selected from the study population. The questionnaire contained thirty items in total. The findings showed that the degree of students' awareness of the effectiveness of AI applications in learning Arabic was high across all items, with an overall arithmetic average of 3.98. The arithmetic averages ranged between 3.67 and 4.26, with paragraph No. 15 ranked first with an arithmetic average of 4.26, while paragraph No. 13 ranked last with an arithmetic average of 3.67. The findings also indicated that gender did not result in any statistically significant differences. However, the results showed that the academic year had a statistically significant effect, with second-year students and above showing the greatest differences. Additionally, the data indicated that the type of college had a significant effect, with students from scientific colleges showing higher awareness.

Keywords: AI applications, Arabic language, effectiveness, learning, students' awareness.

Public Interest Statement

The use of artificial intelligence (AI) in education has transformed rapidly in recent years, enabling new tools and methodologies for improving learning. Studying students' perceptions and readiness to adopt AI applications for supporting Arabic language learning provides critical insights into their perceptions. It is essential for educators, policymakers, and technology developers to understand how AI is shaping various fields, including language learning. This study highlights students' awareness of AI and factors influencing their perceptions to shed light on how AI can enhance Arabic language acquisition and to develop AI-driven tools that are tailored for students.

Introduction

E-learning focuses on providing educational content and imparting skills and concepts to learners through information and communication technologies and multimedia. It enables students to actively interact with colleagues and teachers through electronic systems specifically designed for that purpose. We can think of "e-learning" as a general term for training that uses technology. Numerous individuals with diverse viewpoints and areas of interest contributed to the development of the definition of "e-learning," resulting in a comprehensive and detailed concept that this research study aims to explain. According to the American Society for Training and Development (ASTD), e-learning is an educational system that uses interactive information and communication technology to provide training or educational programs to students at anytime and anywhere (Khalida, 2023; Altakhaineh et al., 2020).

The growth of the Fourth Industrial Revolution and its accompanying technological developments such as robotics, AI, the Internet of Things, autonomous vehicles, 3D printing, nanotechnology, and biotechnology has made technology an essential component of people's lives. This revolution has facilitated the integration of technology into all areas of society, most notably education.

In addition to enabling machines to process information similarly to humans, integrating technology and promoting artificial intelligence techniques in education aim to better understand human intelligence so it can be emulated in the learning process. This approach helps protect human rights and advance sustainable development by fostering effective cooperation between humans and machines during the educational process. AI provides feedback on students' performances, allowing teachers to promptly address areas of weakness. It also helps reduce teachers' workloads, organize the classroom, and gain insights into students' academic progress (UNESCO, 2019; Baker et al., 2019).

AI is a field of technological science that uses machine learning, deep learning, natural language processing, word and image recognition, data mining, and other techniques to create intelligent machines that perform tasks and react in ways similar to the human mind. To emulate human intelligence, AI is built on the study of numerous theories, approaches, strategies, and application systems (Xia, 2020). In addition, AI as a branch of computer science, focuses on creating devices and computer programs that can think similarly to human minds (Ocaña-Fernández, 2019). An artificial intelligence system is essentially a machine learning system. According to Momani (2019), it is the machine's attempt to approach, and occasionally even surpass, the capabilities of the human intellect.

Scientists expect two important things when they look ahead to the next century: First, it will be extremely difficult for humans to notice and keep up with the massive, revolutionary, and lightning-fast advances in technology and cognitive processes. Second, these technological developments will result in

social, political, and economic changes that will create numerous new challenges and issues. Therefore, we need to technically educate and enlighten people to handle these issues and assist society's members in making informed decisions to address them (Brandt, 2002).

The most notable characteristics of AI are its enormous speed and accuracy, which allow it to work for long periods without getting bored or tired. It also excels at data management tasks. Another significant characteristic is its ability to make inferences and draw conclusions, which is one of the greatest scientific achievements in the field of AI. Additionally, AI can represent knowledge, handle a variety of data, learn and teach, and perceive—one of the most sophisticated forms of human intelligence that scientists are still striving to achieve in AI (Farouk, 2012).

Faggella (2019) proposed that implementing AI into the educational process has six distinct characteristics, namely learner's self-direction, working to give the student twenty-first-century abilities, handling different kinds of data, continuous interaction with the student, and access to the classroom remotely, and lifelong learning, also referred to as continuous learning.

Unlike natural intelligence, which requires time and effort for indoctrination, teaching, and learning, in addition to speed in carrying out tasks, AI is stored on a computer, making it quicker to transfer and disseminate data. Compared to natural intelligence, AI is less prone to forgetting, requires fewer resources, and is more permanent (Khalida, 2023).

AI and human intelligence are distinct, although AI aims to emulate human intelligence. Nonetheless, a set of procedures known as "Knowledge Engineering" facilitates interaction between AI and human intelligence. This technique involves transferring expert knowledge to the computer through processes such as processing and verification, and then returning the newly processed data to humans. The knowledge engineering process consists of five stages, as identified by Abdel Latif (2020), Ma and Siau (2018), and Simões-Marques and Figueira (2019):

1. Knowledge Acquisition: AI software stores a large database from various sources.
2. Knowledge Representation: The acquired knowledge is organized by the AI software for practical use.
3. Knowledge Validation: The software conducts tests to validate the quality of the knowledge.
4. Inference: AI software performs induction and deduction to build higher levels of knowledge for problem-solving.
5. Explanation and Justification: In this stage, the software presents new knowledge representing a solution to the problem using appropriate presentation methods, such as visual or audio, with the possibility of interpreting that knowledge.

AI encompasses a wide range of fields, each becoming increasingly diverse over time. These disciplines encompass separate research endeavors and areas of study. Examples include data recognition and coordination, robotics, knowledge engineering, specialized systems, automated thinking, conversational and discourse understanding, corrective systems, decision-making, and problem-solving. From a broader perspective, AI is viewed as a category of knowledge that explores the components, challenges, shared similarities, and relationships among various subfields (Farouk, 2012).

According to Kamel and Mahmoud (2010) and Farouk (2012), the following are some of the most significant applications of AI:

1. Natural Language Processing: This field aims to develop programs and systems that can both

produce and understand human language. Users input data into these systems using normal language, and the computer interprets and understands it.

2. Automated Programming: This process involves a computer finding excellent translators and speedy interpreters, extracting natural language sources, and constructing systems to implement and manage them.

3. Robotics: Robots are electromagnetic devices capable of executing commands from attached computers. AI provides robots with the ability to move, perceive their environment, and react to various external stimuli.

4. Computer Vision: This field requires equipping computers with specific optical sensors to recognize objects and people in their surroundings. It also involves developing technical methods for the computer to identify faces in images.

5. Computer-Aided Learning and Teaching: This involves using computers to manage the teaching and learning process, perform related functions, and direct learners' education instead of relying solely on the teacher.

6. AI-Based Computer Games: These games leverage AI to create challenging opponents. Computers become formidable opponents that can be difficult to overcome in many games.

7. Expert Systems: These are advanced computer systems that gather specialized data in a particular subject for human experts. They organize this knowledge and experience in a way that enables the computer to solve related issues autonomously.

According to Al-Mahamid (2018), organizations are deploying AI applications due to their significant advantages in daily life and society. These applications aim to overcome individual variations, challenges related to time and location, motivate students, reduce the burden of educational objectives, and address the inflation of official curriculum and academic courses in education.

According to Saleem (2017), the development of educational and behavioral sciences, alongside the emergence of modern educational sciences like the science of education and educational design, are among the primary reasons for utilizing modern technology techniques and AI applications in education. These reasons underscore the importance of researching and leveraging contemporary knowledge to enhance the learning and teaching process and raise its qualitative level.

Furthermore, Fahimirad and Kotamjani (2018) highlight population growth and the expansion of knowledge as significant factors driving the adoption of educational technological innovations. With the rapid increase in the number of learners and the accumulation of knowledge, educational institutions face challenges accommodating these numbers and coping with the massive influx of technical and knowledge advancements.

Abdel Wahab (2023) conducted a study to assist outstanding secondary students in developing their creative language identities while examining the impact of AI applications on these characteristics. To achieve this, the researchers established a list of 27 dimensions of the creative linguistic self along with a corresponding measure. The study's findings revealed statistically significant differences in the average scores of the research group students on the major components of their creative linguistic self, both individually and collectively, favoring the post-application phase. The effect size for AI applications was substantial, reaching 0.99%, and the difference was statistically significant at the 0.01 level. The researchers recommended the integration of AI applications in the classroom, attention to the

development of learners' creative linguistic self across various educational levels, and the use of research tools and materials in educational settings.

Hassanein (2023) emphasizes the value of AI in education while focusing on the needs of teachers. To help teachers adapt to AI, he suggests several measures: providing a flexible and advanced infrastructure of wireless communications, computers, and software; offering highly qualified specialists for technical support to address network faults before implementing AI in teaching; preparing training programs for teachers through training courses aimed at enhancing their traditional skills to align with the use of AI; and promoting the culture of AI and its application in education through organizing conferences, seminars, and electronic lectures with student participation. Additionally, he recommends providing appropriate financial support for the application of AI technology, including the purchase of modern devices, programs, and applications, periodic maintenance of devices, and offering incentives and rewards for teachers.

Al-Talouhi (2023) highlights in his study on the e-learning environment and in teaching Arabic language to primary school students the positive impact of AI on the learning process, emphasizing the necessity of AI techniques in education.

Al-Ayadi (2022) study sheds light on how AI algorithms might be applied to address issues with auditory morphology sections. Researchers have attempted to standardize these sections by analyzing them from various perspectives. However, since information is sometimes derived from listening, language learners must rely on their cognitive abilities to memorize the subject matter.

One of these sections focuses on the abstract triple verb in the present tense, its origin, and irregular plurals. The study employed the "Decision Tree" and "K-Nearest Neighbor" algorithms as models to demonstrate their application to two issues previously addressed by researchers: first, the irregularity of these sections within a governing rule, and second, the multiple sources of a single verb. "Decision Tree" and "K-Nearest Neighbor" algorithms are classification algorithms within the field of machine learning, a subset of AI. The study yielded several findings, the most significant of which explained the application of AI algorithms to treat auditory morphology sections and how to leverage them effectively. Among the study's recommendations, the most important is that, in addition to investing in AI algorithms and their benefits, Arabic language learners should utilize the available tools at their disposal.

The effectiveness of AI applications in education is largely dependent on teacher training, as suggested by Jatileni et al. (2023). This is particularly true for teachers who oversee the teaching process. Thus, Jatileni et al. (2023) aim to elucidate the factors influencing Nigerian in-service teachers' behavioral intention and willingness to teach AI. The results demonstrated that while confidence in teaching AI significantly predicts the intention to teach AI, the perceived importance of AI highly predicts the desire to teach AI. Although other factors may influence how AI is taught, teachers' intentions and desire to utilize AI in the classroom cannot be solely predicted by societal benefits or concerns. The researchers discussed the implications of their findings for the implementation of AI in schools and highlighted future directions.

Zhao et al. (2019) conducted a study to determine the impact of AI-based online learning platforms in China. Utilizing a critical descriptive technique based on the analysis of teaching systems, the study examined research studies that employed AI-based online teaching systems. The findings demonstrated that the use of AI-based online learning platforms had enhanced students' academic

performance.

Roll and Wylie (2016) aimed to identify the domains in which AI in Education (AIED) excels. The researchers examined 47 studies over a three-year period to identify common strategies that the AIED field may employ. These findings recommended that two parallel paths need to be pursued to impact education over the next 25 years: The first involves an evolutionary process that focuses on existing teaching practices, teacher collaboration, and the diversification of technologies and fields. The second path is groundbreaking, promoting the integration of AI technologies into students' everyday lives to support their communities, goals, customs, and cultures.

Research questions

The researchers, who are university professors specializing in teaching the Arabic language, identified a discrepancy in the viewpoints of Al Ain University students in the United Arab Emirates regarding their awareness of the effectiveness of AI applications in teaching Arabic. This observation led to the determination of the study's problem, which aimed to answer two questions:

1. What is the degree of students' awareness of the effectiveness of AI applications in learning the Arabic language at Al Ain University in the United Arab Emirates?
2. Does the degree of awareness of students at Al Ain University about the effectiveness of AI applications in learning the Arabic language differ depending on certain variables such as gender, scientific specialization, and academic year?

The significance of study

The study aims to identify the degree of students' awareness of the effectiveness of AI applications in learning the Arabic language at Al Ain University in the United Arab Emirates, while considering various variables. This research holds significance as it determines the level of awareness among Al Ain University students regarding the efficacy of AI applications for Arabic language learning. By conducting this study at Al Ain University, it highlights the substantial impact that students' awareness of AI application effectiveness can have on shaping their approach to learning Arabic. Furthermore, this research is crucial for Arabic language educators as it enables them to track students' progress in language acquisition and enhance their comprehension of digital literacy through AI technology utilization.

Limitations of the study

*   Temporal Constraints: The study was conducted during the first semester of the 2023-2024 academic year.
*   Objective Constraints: The study focused solely on assessing the degree of students' awareness of the effectiveness of AI applications in learning the Arabic language at Al Ain University in the United Arab Emirates.
*   Spatial Constraints: The study's sample comprised students from Al Ain University in the United Arab Emirates who were enrolled in Arabic language courses as part of their mandatory university curriculum.
*   Human Constraints: The study included students from both the scientific and humanities colleges at Al Ain University in the United Arab Emirates.

Procedural Definitions

- AI Applications: This refers to computer science applications that empower programs to perform tasks requiring human-like capabilities, such as problem-solving and critical thinking (Al-Maliki, 2023, p. 95).
- Students' Awareness: This denotes the extent to which Arabic language students grasp the research concept, quantified by the level attained through their responses to the study's instruments.
- Effectiveness: This measures the degree to which the concept mapping strategy successfully accomplishes its intended objectives in aiding university students' comprehension of rhetorical concepts within the Arabic language curriculum.
- Arabic Language: This encompasses an educational curriculum designed to foster students' proficiency in speaking, listening, reading, and writing Arabic through the study of literary content, including prose and poetry. It is a mandatory course taught across all colleges at the university.

Methodology

At Al Ain University in the United Arab Emirates, the researchers employed a descriptive analytical approach, which aligns with the study's nature. Through field surveys, this method aimed to gather comprehensive information and assess the extent to which students are aware of the effectiveness of AI applications in learning the Arabic language.

Sample of the study

The study population comprised students from Al Ain University's six colleges who were enrolled in Arabic courses as a degree requirement. For the academic year 2023–2024, a total of 286 male and female students were enrolled, with 175 completing the questionnaire. Fifteen responses were excluded from the total responses, resulting in a study sample of 160 male and female students. This sample was carefully selected to ensure the validity of the questionnaire used as a research tool. Table (1) displays the distribution of the study sample by variable.

Table (1): Distribution of the study sample, frequencies, and percentages according to the study variables

	Category	R	%
Gender	Male	73	42.0
	Female	101	58.0
Academic Year	First Year	122	70.1
	Second Year and Above	52	29.9
College	Humanities	123	70.7
	Scientific	51	29.3
Total		174	100.0

Data collection procedures

The researchers finalized the questionnaire, comprising thirty paragraphs aligned with the study's objectives and subjects. To enhance the accuracy of the study tools, a five-point Likert scale was utilized.

Each degree on the scale—ranging from strongly agree to strongly disagree was assigned a numerical score: 1, 2, 3, 4, and 5, respectively. For result evaluation, a scale was adopted: scores between 1.00 and 2.33 indicated low, scores between 2.34 and 3.67 indicated moderate, and scores between 3.68 and 5.00 indicated high. The questionnaire's specifications were developed based on relevant educational literature. Expert input from arbitrators, prior research, and the researchers' teaching experience contributed to its refinement. Additionally, expert opinions from the field of educational research were sought. The scale was determined using the formula: (Upper limit of scale (5) - Lower limit of scale (1)) divided by the number of required categories (3), resulting in (5-1)/3 = 1.33. This value (1.33) was then added to the end of each category.

Validity of the study

Following the initial draft of the questionnaire, the researchers sought feedback from a panel of highly skilled and experienced arbitrators in the study's field. They requested input on the questionnaire's clarity, suitability, and alignment with the study's objectives, including suggestions for additions, deletions, or modifications. The study tool underwent adjustments based on the arbitrators' feedback, resulting in a final version comprising thirty items. The construction processes of the questionnaire and the judgments of the arbitrators were considered indicators of its validity.

To assess the construct validity of the scale, the researchers conducted an exploratory sample involving thirty male and thirty female students who were not part of the study sample. Correlation coefficients between each item and the scale's total score were calculated to determine the scale's implications. The correlation coefficients ranged from 0.46 to 0.91, as shown in the following table.

Table (2): Correlation coefficients between the paragraph and the total score of the scale

Paragraph number	Correlation coefficient	Paragraph number	Correlation coefficient	Paragraph number	Correlation coefficient
1	.74**	11	.80**	21	1
2	.74**	12	.52**	22	2
3	.57**	13	.75**	23	3
4	.73**	14	.78**	24	4
5	.54**	15	.60**	25	5
6	.79**	16	.66**	26	6
7	.46(*)	17	.91**	27	7
8	.69**	18	.64**	28	8
9	.50**	19	.75**	29	9
10	.51**	20	.73**	30	10

*Statistically significant at the significance level (0.05).

** Statistically significant at the significance level (0.01).

It should be noted that all correlation coefficients were of acceptable and statistically significant degrees, and therefore none of these paragraphs were deleted.

Reliability of the study

To validate the stability of the study tool, the test-retest method was employed. This involved

administering the scale to a group of thirty male and female students who were not part of the study sample, then reapplying it after a two-week interval. The Pearson correlation coefficient between the estimates for the two administrations was calculated and found to be 0.91, indicating strong stability. Additionally, the reliability coefficient was computed using the Cronbach Alpha equation, employing the internal consistency approach, and yielded a value of 0.85. These values were deemed appropriate for the study's purposes.

Results

The researchers utilized the social statistics program SPSS to analyze the data after transcribing and entering it into a computer. Arithmetic means and standard deviations were calculated to address the study's questions. To demonstrate the statistical significance of the differences between the arithmetic means, a three-way analysis of variance was conducted. The (F) value was determined for each field of study.

To answer the first research question, the arithmetic means and standard deviations of the degree of students' awareness of the effectiveness of AI applications in learning the Arabic language at Al Ain University in the United Arab Emirates were extracted, and the table below shows this.

Table (3): Arithmetic means and standard deviations of the degree of students' awareness of the effectiveness of AI applications in learning the Arabic language at Al Ain University in the United Arab Emirates, arranged in descending order according to the arithmetic means

Rank	Number	Paragraphs	SMA	Standard deviation	Level
1	15	I believe that artificial intelligence applications enable students to learn at anytime and anywhere in the world	4.26	0.899	High
2	9	I realize that AI applications facilitate the teaching and learning process	4.24	0.824	High
3	3	I see that AI applications provide flexibility in presenting scientific material	4.2	0.804	High
4	8	I find that AI applications meet the needs of students with disabilities	4.16	0.934	High
5	16	I feel that AI applications help solve problems related to the teaching-learning process	4.14	0.835	High
6	24	I believe that AI applications contribute to enhancing self-learning	4.13	0.816	High
7	27	I see that AI applications help in memorizing and retrieving information	4.05	0.901	High

8	23	I feel that AI applications increase learning opportunities by completing tasks related to Arabic language skills	4.04	0.778	High
9	10	I believe that AI applications help students innovate in the educational process	4.03	0.915	High
10	7	I see AI applications reducing reliance on textbooks	4.01	0.94	High
10	12	I believe that AI applications provide learning styles that suit students' inclinations, trends, and need	4.01	0.863	High
10	29	I believe that applications of AI contribute to clarifying linguistic concepts among student	4.01	0.88	High
13	5	I feel that artificial intelligence applications help students break free from one-style education	4	0.84	High
13	17	I believe that AI applications help students employ and apply knowledge and information	4	0.88	High
15	11	I find that AI applications contribute to enhancing cooperative learning among student	3.97	0.943	High
16	2	I believe that AI applications help in providing feedback to students in learning the Arabic language	3.96	0.814	High
17	14	I realize that AI applications increase students' motivation to participate in the learning process	3.94	0.848	High
17	22	I see that AI applications help in understanding texts by linking Arabic language science	3.94	0.87	High
19	6	I feel that AI applications reduce the stress of trial and error in learning	3.93	0.903	High
19	20	I find that AI applications reduce the number of learning hours	3.93	0.959	High
19	25	I believe that AI applications increase the creative ability to read and analyze text	3.93	0.941	High
19	26	I believe that AI applications link theoretical information with applications	3.93	0.88	High

19	30	I find that AI applications emulate human intelligence in providing students with language skill	3.93	0.925	High
24	4	I believe that AI applications help in making decisions related to the teaching-learning process appropriately	3.92	0.915	High
25	19	I believe that applications of AI increase the imaginative ability in expressive writing	3.88	0.933	High
26	18	I believe that AI applications develop students' listening skills	3.86	0.978	High
27	21	I believe that AI applications help develop students' language skills	3.85	0.962	High
28	1	I believe that AI applications consider individual differences among students in learning the Arabic language	3.84	0.942	High
29	28	I believe that AI applications help enhance students' ability to pronounce linguistic sounds correctly	3.78	1.015	High
30	13	I believe that AI applications contribute to raising the student's level of oral expression skill	3.67	1.109	Medium
		Total	3.98	0.644	High

Table (3) indicates that the arithmetic averages ranged between 3.67 and 4.26. Paragraph No. (15), stating "I believe that AI applications enable students to learn at any time and in any place in the world," achieved the highest rank with an arithmetic average of 4.26. In contrast, paragraph No. (13), expressing "I see that the applications of AI contribute to raising the student's level in the oral expression skill," ranked last with an arithmetic average of 3.67. The overall arithmetic average of students' awareness of the effectiveness of AI applications in learning the Arabic language at Al Ain University in the United Arab Emirates was 3.98.

The study's findings highlighted the advantages of utilizing AI applications in Arabic language learning. The researchers attribute this outcome to the recognition among Al-Ain University's educational stakeholders of the importance of equipping students with the knowledge and skills required for applying AI to both general learning and Arabic language learning specifically. Additionally, the researchers credit the students' strong inclination towards incorporating AI applications into their education as another contributing factor to this outcome. This inclination facilitated greater awareness among students regarding the benefits of AI applications for learning, particularly in the context of Arabic language acquisition. Furthermore, the interest of both Al Ain University and the United Arab Emirates in technological advancements played a role, as the development of smart electronic platforms

familiarized students with the use of such applications.

This is also attributed to the United Arab Emirates' prioritization of high-quality education as part of its strategy to cultivate human capital and foster a diverse, knowledge-based economy, in line with sustainable development goals. The COVID-19 pandemic has notably heightened students' awareness of the effectiveness of AI applications in learning, including Arabic language acquisition. This is largely due to the shift towards remote learning during the pandemic, facilitated by various electronic applications and programs. The findings of this study are consistent with those of previous research conducted by Brandt (2002), Al-Ayadi (2022), and Roll and Wylie (2016).

To answer the second research question, the arithmetic means and standard deviations of the degree of students' awareness of the effectiveness of AI applications in learning the Arabic language at Al Ain University in the United Arab Emirates were extracted according to the variables of gender, academic year, and college, and the table below shows this.

Table (4): Arithmetic means and standard deviations of the degree of students' awareness of the effectiveness of AI applications in learning the Arabic language at Al Ain University in the United Arab Emirates according to the variables of gender, academic year, and college.

	Categories	SMA	Standard deviation	Number
Gender	Male	3.89	0.755	73
	Female	4.05	0.544	101
Academic year	First year	3.86	0.651	122
	Second year and above	4.28	0.524	52
College	Humanities	3.87	0.636	123
	Scientific	4.27	0.577	51

Table (4) clearly illustrates variations in the arithmetic means and standard deviations of students' awareness regarding the effectiveness of AI applications in learning the Arabic language at Al Ain University in the United Arab Emirates across different categories of variables, including gender, academic year, and college. To assess the statistical significance of these differences between the arithmetic means, a three-way analysis of variance was conducted, as presented in Table (5).

Table (5): Three-way analysis of variance of the effect of gender, academic year, and college on the degree of students' awareness of the effectiveness of AI applications in learning the Arabic language at Al Ain University in the United Arab Emirates.

Source of variance	Sum of squares	Degrees of freedom	Mean squares	F value	Statistical significance
Gender	0.301	1	0.301	0.845	0.359
Academic year	4.519	1	4.519	12.679	0
College	4.251	1	4.251	11.926	0.001
Error	60.594	170	0.356		
Total	71.719	173			

Analysis of Table (5) reveals distinct patterns. Firstly, there were no statistically significant differences

(α = 0.05) attributed to gender, as evidenced by an F value of 0.845 and a statistical significance of 0.359. This finding suggests a uniform level of awareness regarding the effectiveness of AI applications in learning Arabic among both male and female students. The parity in awareness may stem from the equitable educational opportunities, consistent study materials, and similar university environments experienced by students regardless of gender.

In contrast, statistically significant differences (α = 0.05) were observed based on academic year, indicated by an F value of 12.679 and a statistical significance of 0.000. These differences favored students in the second academic year and beyond. The researchers suggest that this discrepancy arises from increased exposure to AI applications among students in later academic years. These students have had more opportunities to utilize such technologies, resulting in greater familiarity and proficiency with AI-driven learning methods.

Furthermore, statistically significant differences (α = 0.05) were noted based on college, with an F value of 11.926 and a statistical significance of 0.001, favoring scientific colleges. This disparity can be attributed to the inherent reliance of AI applications on computer technology. Students in scientific disciplines typically exhibit greater comfort and proficiency in utilizing such applications due to the technological emphasis within their academic fields. Their continuous engagement with technology across various subjects further enhances their ability to effectively employ AI applications in the learning process.

Conclusion

The findings of this study underscore the positive influence of integrating artificial intelligence applications into Arabic language learning, with students exhibiting a consistently high awareness of their effectiveness across all questionnaire items (averaging 3.67). Additionally, no statistically significant differences were found based on gender, indicating a uniform perception of AI's efficacy among male and female students. However, noteworthy disparities emerged concerning the impact of academic year and college. Statistical analysis revealed significant differences favoring students in higher academic years, suggesting that increased exposure to AI applications over time enhances awareness of their benefits. Similarly, students enrolled in scientific colleges exhibited greater awareness compared to their counterparts in other disciplines, underscoring the role of specialized knowledge and technological proficiency in leveraging AI for learning Arabic. Furthermore, the study has contributed to enhancing the awareness and competencies of Al Ain University's teaching staff in incorporating AI applications into instruction, particularly for Arabic language education. By equipping both educators and students with the requisite skills, the study promotes the effective integration of AI into the educational process. Ultimately, these findings serve as a valuable resource for educators and students alike, facilitating informed decisions regarding the utilization of AI applications in language learning. Moreover, they emphasize the importance of ongoing training initiatives to further enhance educators' and students' proficiency in leveraging AI for educational purposes.

Recommendation

According to the results of the study and its discussion, the following recommendations can be made:

1. Invest in students and apos; knowledge of the concepts of artificial intelligence by opening the way for them to participate in events aimed at developing the applied aspect of artificial

intelligence techniques.

2. Address the growing gap between the rapid development of artificial intelligence and its application in teaching and learning by preparing a teacher before and during service to prepare for the development of artificial intelligence in education.

3. Attention to the establishment of infrastructure suitable for the application of artificial intelligence in institutions.

4. Education, with the development of the educational environment to interact with artificial intelligence applications.

5. Encourage teachers to build educational software based on artificial intelligence applications.

6. The need to train teachers in the use of artificial intelligence applications in the educational process.

7. Teachers and students need to be physically and morally motivated when employing artificial intelligence applications in the educational process.

Biographies

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Authorship and Level of Contribution

All authors contributed to the research of the literature, collection of data, analysis, and interpretation of the collected data.

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