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The role of artificial intelligence techniques in improving the quality of services provided to students at Private Universities in Jordan from the point of view of their professors

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The study aimed to reveal the role of artificial intelligence techniques in improving the quality of services provided to students at private universities in Jordan from the point of view of faculty members. The researcher used the descriptive analytical approach, and the study used a questionnaire tool to measure the role of artificial intelligence techniques, which consisted of (20) items that dealt with the services provided by artificial intelligence techniques to students at private universities in Jordan from the point of view of faculty members. Validity and reliability were verified and found to be acceptable for the purposes of the study. It was applied to a random sample of the study population, consisting of (218) university professors, during the second semester of the year (2023-2024) in private universities in Jordan. Descriptive statistics were used, represented by arithmetic means, standard deviations, and a t-test for independent samples, and an analysis was applied Triple contrast. The results of the study showed that there is a prominent and high role for artificial intelligence technologies in improving the quality of educational services in universities.

There are differences in the opinions of the study sample members about the role of artificial intelligence techniques in the level of educational services, according to the variables of gender, in favor of "males," according to the academic rank variable, in favor of "professor doctor," and according to years of experience, in favor of "10 years or more." The study recommended a number of recommendations, the most important of which are Ensuring the introduction of technologies into university services to keep pace with the rapid development of artificial intelligence, overcoming obstacles related to accepting new roles and responsibilities through



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artificial intelligence technologies, developing the services provided through artificial intelligence technologies and developing them continuously.

Keywords: technology, artificial intelligence, private universities, quality of services.

Introduction:

The world has witnessed a remarkable development in the field of artificial intelligence, as it has been used in most areas of life such as medicine, engineering, factories, economics, space sciences, communications and education, which called on educational institutions to focus in their curricula on the concept of technology and artificial intelligence and how to apply it and actually use its programs in providing various services to keep pace with modern technological development, this development called on researchers to research the concept of artificial intelligence and include it theoretically and practically in the various stages of education.

Artificial intelligence was known by several concepts, as it was referred to by Qamoura (2018), Hudasi and Adi (2020) as a science in technology associated with the concept of human intelligence, learning computer language, the way to respond to commands and understanding the software related to their implementation, and artificial intelligence aims to design computer systems capable of thinking, understanding knowledge, translating and executing commands as the mentality of the human being, and these systems are called (knowledge Based System), and these systems are characterized by the ability to perceive, infer and conclude (Salem, 2011).

Universities have provided technological tools specially prepared to provide university services to their students, to contribute to facilitating the educational process for them, developing their skills, developing their abilities, using time and providing services with the least effort and speed (Al-Ajeez and Nashwan, 2016), and despite the importance of artificial intelligence techniques in education in general, as confirmed by a number of studies such as (McCarthy, 2017), there is a fact that cannot be overlooked based on the readiness and readiness of universities to accept artificial intelligence technologies in terms of cost and readiness To deal with it efficiently, artificial intelligence depends on increasing the efficiency of teachers and students in applying it in a correct way, better understanding how it works, and increasing their awareness and culture. (Shaltout, 2023) This requires monitoring systems and a quality system to evaluate and follow up the services provided in line with the objectives of educational institutions in accordance with the legal regulations related to artificial intelligence programs (Khare, & Khare, 2018), and



therefore this study was entitled: " The role of artificial intelligence techniques in improving the quality of services provided to students in private universities in Jordan from the point of view of their professors" so that according to the results and recommendations of the study, appropriate decisions can be taken.

The problem of the study and its questions: The problem of the study lies in the lack of sufficient awareness of the importance of artificial intelligence and the way it is used and the quality of services provided to students through artificial intelligence programs Educational institutions in general and in universities in particular, and this is due to a set of challenges facing private universities in Jordan from the point of view of their teachers, such as the lack of keeping pace with modern developments and knowing the concept of artificial intelligence and how to apply it in the right way, and this prompted the researcher to research the quality of services provided to university students using artificial intelligence techniques, such as creating content Educational, creating tests, and presentations, providing multiple student services such as registration, withdrawal, addition, obtaining materials electronically at any time, and evaluating students' performance.

The researcher noted through her review of the educational services provided to students in private Jordanian universities that there is a disparity in the quality of services provided to students using artificial intelligence techniques, and there are challenges that reduce the quality of services provided to them, so it was necessary to study the role of artificial intelligence techniques in educational institutions to raise the level of quality of services provided to students better, **specifically the formulation of the study problem is summarized in the following questions:**

- 1- What is the role of artificial intelligence techniques in improving the quality of services provided to students of private universities in Jordan from the point of view of their professors?
- 2- Are there statistically significant differences ($\alpha = 0.05$) in the role of artificial intelligence techniques in the level of educational services provided to students of private universities in Jordan from the point of view of their professors due to the variables of gender, academic rank, and years of experience?

Importance of the study:

It is hoped that the results of this study will be used as follows:



Theoretical importance:

- Identify the role of artificial intelligence technologies that offer students in private universities in Jordan.
- Take executive measures to improve the quality of services provided to students in universities in light of the use of artificial intelligence techniques that reflect their performance in achieving goals.
- Enriching the Arab Library with studies on the subject of the use of artificial intelligence techniques in universities.
- Enriching the Arab library with studies on the subject of quality of services provided in universities.

Practical importance:

- Keeping abreast of technological developments in educational institutions in the Middle East in order to survive and continue.
- Developing student services in private universities in Jordan, as artificial intelligence is a modern and important concept, and that it is linked to university services in light of the tremendous technological revolution.
- The dependence of private and public universities on artificial intelligence in providing their various services.

Objectives of the study:

- This study aimed to shed light on the role of artificial intelligence in improving the quality of services provided to students in private universities in Jordan from the point of view of their professors, and to identify artificial intelligence techniques, their objectives, and their importance in universities.
- Identify the services that artificial intelligence techniques can perform for university students in private universities in Jordan.

Terminology of the study:

Artificial intelligence idiomatically: Artificial intelligence techniques can be referred to by the ability of digital machines and computers to perform certain tasks that mimic and resemble those performed by intelligent objects. (Osoba and Wilser, 2020), which is the science that is concerned with making electronic systems with intelligence similar to human intelligence, enabling systems to think, make decisions, and act according to them, in a manner commensurate with the nature of the tasks assigned to them. (Shehata, 2022), which is the commands performed by machines programmed to simulate human mental abilities and work patterns, (Zain, 2019).



The researcher defined artificial intelligence procedurally: modern technological techniques, programs, software and ready-made templates for services that include the correct steps and direct guidance methods to enter the necessary data into software and pages to implement services that help students find solutions to their problems and facilitate their procedures at the university and implement their services with less time and effort using modern technology techniques.

Quality of services provided to university students idiomatically: The quality of services in educational institutions is meant as the criteria and foundations by which performance in educational institutions is measured, whether with regard to planning, setting goals or evaluation in order to know the strengths to enhance them, and the weaknesses to address them, with the aim of improving performance and developing for the better (Darwaza and Ahmed, 2023). It was also defined as the effectiveness of the services and efforts provided by various educational institutes in order to help students carry out their various services, and to provide electronic services that save them time and effort. (Dahshan, 2019)

The researcher defined the quality of services provided to students procedurally: the standards and foundations by which the effectiveness of the services provided to students in universities is measured, as the quality is related to the extent to which these services are proceeding in the right way in accordance with international quality standards for educational institutions.

Limitations of the study:

The current study was limited to the following limits:

- Objective limits: The study was limited to the role of artificial intelligence techniques in improving the quality of services provided to students in private universities in Jordan from the point of view of their professors, and the results of this study are determined by the honesty and consistency of the tool used in it and its psychometric properties.
- Human limit: All university professors with the rank of professor and doctor who teach students in private universities.
- Spatial limit: Private universities in Jordan.
- Time limit: Second semester of the year (2024-2023).

Preface:

Artificial intelligence scientists and researchers differed in their definition of this science, as most experts agreed that its concept is limited to software that is involved in computer design, to achieve tasks that serve institutions in order to achieve the goals set for them (Tolba, 2016), and (Abdullatif, Mahdi, and Ibrahim, 2020) defined artificial intelligence as: "the ability of computers to think like humans, with the aim of designing software that can replace humans in perception,



analysis and decision-making," and Al-Astal (2021) and Zidan (2019) pointed out that artificial intelligence is a technology It provides a variety of services to students within the educational institution, which led to an increase in interest in it and became a wide field taught within universities, and it is noticeable the increasing interest in the use of artificial intelligence for its ability to achieve goals in various fields. (Bonnet, 2016)

Artificial intelligence is an understanding of the nature of human intelligence to create programs capable of simulating intelligent behavior (Carlos, 2018), and this means the ability of programs to address an issue or make a decision for a specific situation by referring to the many diverse inferential processes that have been fed to the programs in advance, and designing intelligent systems that simulate human nature, and look at solving problems using software specially designed for this purpose (Abdul Majeed, 2019).

Belharet (2020, Abdelhadi (2019), and Mounir (2019) pointed out that modern technology reflects an artificial system to achieve goals, but there is a more accurate definition that has been developed during the last decade that educators have referred to in their studies such as Abu Waqia (2018), Al-Astal, Akl and Al-Agha (2021), and (Al-Khatib, 2019), as they showed that there are similar points in looking at artificial intelligence based on computer science, which is related to simulating human behavior, and highlighting the capabilities of artificial intelligence in implementing some Services related to human intelligence, such as task execution, problem solving, feedback, and performance appraisal.

Ahmed (2019), Abu Mandour (2020) and Change (2019) pointed out that the use of robots and artificial intelligence programs in universities raises many challenges, especially with regard to students, such as the appropriateness of university laws and their ability to understand the application of new technology, especially since artificial intelligence techniques are a mandatory requirement in most modern universities.

Artificial intelligence in building knowledge, analyzing and applying it (Jena, 2018), Harkut, D., & Kasat, K. 2019, and Koh & Chai (2019) pointed to the need for universities to develop technological technologies in universities, especially with the presence of traditional services and the rigidity of courses, this reduces the quality of services provided to students. The study of Cortellazzo & Bruni & Zampieri (2019) also emphasizes the need to integrate modern technology with the systems of educational institutions, including universities, to raise the level of creativity and contribute to the development of university work, achieve goals, and provide innovative solutions.

In light of the focus of the agreements between advanced universities on cooperation in how to fully benefit from artificial intelligence technology, and even allocate courses bearing its names in its plans (Al-Dahyat (2019; Al-Muhairi, 2020; Al-Dahshan, 2019), the researcher was keen to



study the role of artificial intelligence techniques in improving the quality of services provided to students in private universities in Jordan from the point of view of their professors in light of modern technology in order to achieve its goals, and excel in providing student services to ensure student satisfaction. To ensure attracting the largest number of students These universities use many unique plans and modern software in order to improve their performance, and thus achieve quality in the services provided to students in universities in particular and educational institutions in general.

Previous studies:

Arab and foreign studies related to the subject of the study were presented and arranged from the latest to the oldest:

Saad (2023) conducted a study aimed at measuring the importance of artificial intelligence technology in light of the challenges of its application in the educational process, and used the descriptive approach in data analysis, standard deviations, Cronbach alpha and analysis of variance (ANOVA) The study relied on a sample of master's students at the Faculty of Education - Lebanese University by distributing a questionnaire to (33) students holding master's degrees (M1-M2) in The academic years (2021-2022-2023), the researcher selected them randomly, and found that the axis of the level of importance of artificial intelligence technology came with a high degree with an arithmetic mean (3.60) and a standard deviation (0.388), and that the axis of the challenges of applying artificial intelligence in the educational process came with a high degree with an arithmetic mean (3.67) and a standard deviation (4.150), and there were statistically significant differences in the estimates of the sample members on the total scale among master's students due to the variable (gender), as the significance level took the value (0.042) is less than (0.05), It is not statistically significant.

Al-Masry (2022) conducted a study aimed at revealing the role of artificial intelligence techniques in improving the quality of services provided to students at the University of Jordan from their point of view, and the descriptive analytical approach was used, and the study sample consisted of (410) male and female students, and the results of the study concluded that the employment of artificial intelligence techniques at the University of Jordan from the point of view of its students came to a medium degree, as well as the quality of services provided to its students to a medium degree, and the results indicated that there were no statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the quality of services provided to students due to the gender variable and the study program, as well as the presence of statistically significant differences due to the degree variable and in favor of the higher diploma and master's degree, and the results showed that there is a statistically significant role at the level of significance



($\alpha \leq 0.05$), for the fields of artificial intelligence in improving the quality of student services at the University of Jordan.

Al-Subhi and Al-Farani (2020) conducted a study that revealed the possibility of adopting artificial intelligence technologies in Saudi higher education in light of the capabilities, requirements and challenges, and what it is hoped that these technologies will provide to higher education in the Kingdom, and a set of applications that are expected to serve education were reviewed and discussed, including: the application of the mathematical thinker, the site (Netex Learning), as well as the site (Brainly), and at the end of the study the researchers presented a proposed plan for the introduction of artificial intelligence techniques for higher education based on several sequential steps, and was attached Pilot activities accompanying the implementation of the plan.

Al-Shawawra (2019) conducted a study aimed at identifying the level of quality of educational services provided by the Islamic University in Madinah from the students' point of view, and verifying the extent to which that degree varies according to the academic program. The researcher followed the descriptive analytical approach. The study population consisted of all university students, while the sample was randomly selected. The number reached (816) students. The results of the study showed that the quality of educational services was at a good level, and the results showed that there are statistically significant differences in the level of services by students attributed to the academic program in the overall performance on the scale.

Al-Mutairi (2019) conducted a study aimed at identifying the shortcomings in the application of artificial intelligence as an input to the development of educational decision-making in the Kuwaiti Ministry of Education. The study used the descriptive approach and applied the Delphi method, and the study sample was represented in (56) academic leaders in the Ministry of Education in the State of Kuwait, and one of the most prominent results of the study is the absence of training leaders in educational decision-making on artificial intelligence, as well as the scarcity of smart technology used in decision-making. Developed training of workers on artificial intelligence.

Petruzzellis et al. (Petruzzellis, Duggento & Romanazzi, 2016) conducted a study aimed at knowing student satisfaction with the quality of service in Italian universities - a case study from the University of Bari / Italy, and the study used the (SERVQUAL) scale, and the interview tool, and the study was applied to a stratified random sample of students enrolled in (12) colleges of the University of Bari, and the study found that there is a weakness in the student's satisfaction with the quality of services provided to them amounting to (46), and that the quality of services provided to them does not amount to The required level of e-services.



Seif, Sartawi and Al-Aqraa (2014) conducted a study aimed at evaluating the level of quality of student services, the satisfaction of students of Jordanian public universities from the point of view of students, and identifying the impact of the quality of services on their satisfaction, and the data were collected through (776) questionnaires, and the descriptive analytical approach was used, and the results of the study found that the students' evaluation of the quality of services and student satisfaction was average, and that there was an impact of the quality of services on student satisfaction, and there were statistically significant differences attributed to gender and in favor of females.

Shah & Yaqoob (2013) conducted a study aimed at knowing the satisfaction of students with electronic services in higher education in Pakistan, where the study analyzed the quality of student service, and its five dimensions (tangible, reliability, responsiveness, assurance, and empathy) that lead to the satisfaction of university students in (22) universities spread in the four provinces in Pakistan distributed over a sample of (113) male and female students distributed to them the questionnaire as a tool for data collection and analysis, and the results of the study stated that electronic services in dimensions (reliability, guarantee, and student satisfaction). University students) came in at a high level for students, while the dimensions of e-services (responsiveness, empathy and tangible) were less important to students.

The location of the current study from previous studies: By reviewing previous studies related to the current study and standing on its theoretical literature and scientific methodology, it was found that there is a group of studies applied to universities and dealt with the subject of artificial intelligence such as the Saad study (2023), and some studies dealt with artificial intelligence in education in general, such as a study (Mira and Cutter, 2019), (Al-Mutairi, 2019), and (Sobhi, and Al-Farani, 2020), and the current study was distinguished from previous studies in combining artificial intelligence and its role in the services provided For students in universities, the current study differed from previous studies in the study population and sample, and the researcher benefited from previous studies such as the study (Al-Masry, 2022), the study of Petruzzellis, Duggento & Romanazzi (2016), and Shah and Yaqoob (2013) in developing the tool of this study, which is the questionnaire for collecting and analyzing information.

Study Methodology:

The descriptive and analytical approach was used for its suitability for this type of study.

Study population and sample: The study population consisted of all university professors in private universities in Jordan in the second semester of the academic year (2022/2023), amounting to (230) university professors with the rank of professor and doctor, where (230) questionnaires were distributed to the number of members of the study population, (218)



questionnaires were retrieved, and after entering the data, (12) questionnaires were excluded as they are not suitable for analysis, and thus the final study sample consisted of (218) individuals.

Table (1) shows the distribution of the study sample according to variables (gender, academic rank, and years of experience).

Table (1) Distribution of Study Sample by Gender Variables, Academic Rank, and Years of Experience

Percentage	Repetition	Categories	
15.1	33	Male	Gender
84.9	185	Female	
80.7	176	Professor	Academic Rank Professor
19.3	42	Doctor	
59.6	130	Less than 10 Years	Years University Teaching Experience
40.4	88	more than 10 years	
100%	218	Total	

Description of the study tool

to achieve the objective of the study The study tool was developed based on theoretical literature and previous relevant studies, as the tool consisted in its initial form of a questionnaire that contained (20) items, dealing with the services provided by artificial intelligence techniques with regard to the educational aspect of private university students from the point of view of their teachers to determine the role of artificial intelligence techniques in improving the quality of services provided to students in private universities in Jordan.

The validity and stability of the study tool

The validity of the questionnaire was confirmed by presenting it to a group of arbitrators with competence and experience, and their observations and amendments were taken into account and finalized. Then the tool was applied and the internal consistency coefficient of the tool (Cronbach alpha) was extracted and amounted to (0.86), which is an acceptable value for the purposes of applying the study, as the value is considered acceptable if it is (0.70) and above.



Study variables:

First: the independent variables, namely:

- Gender: It has two levels (male, female).
- University rank of university professor: It has two levels (professor, doctor).
- Years of experience: It has two levels (from 5 to 10 years), and (10 years or more)

Second: The only dependent variable in this study is:

- Electronic services provided to students in private universities in Jordan.

Procedures for applying the study:

for the purpose of applying the study A number of procedures were carried out as follows:

- Designing the study tool in line with the objectives and questions of the study and ensuring its validity for application.
- Obtaining a task facilitation letter addressed to the university presidency to allow the collection of necessary data related to the application of the tool.
- Ensure the validity of the retrieved tools and unpack the acceptable results from them on the computer.
- Conducting the necessary analyzes using the (SPSS) program and extracting the results.

Statistical methods used:

- frequencies and percentages.
- Arithmetic averages and standard deviations.
- Test (T) for independent samples.
- Triple Variance Analysis Test (3way ANOVA).

Presentation and discussion of results

Through this part, the results of the study will be presented, which aims to identify the role of artificial intelligence techniques in improving the quality of educational services provided to students of private universities in Jordan, and the following is a presentation of the results of the study, its discussion, and recommendations.

The results related to the first question, which states: "What is the role of artificial intelligence technologies in improving the quality of educational services provided to students of private universities in Jordan?"

To answer this question, the arithmetic averages and standard deviations of the role of artificial intelligence techniques in improving the quality of services provided to students were extracted.

Table (2).

Arithmetic averages and standard deviations of the role of artificial intelligence techniques in improving the quality of educational services provided to students of private universities in Jordan (n = 218)

The table shows that the general average of the study sample's estimates on the role of artificial intelligence techniques in improving the quality of educational services in it was high with an arithmetic mean of (3.85) and a standard

Level	Standard deviation	Average	Questionnaires	N	Rank
High	1.00	3.87	Artificial intelligence techniques help determine the approved course plan for students according to their specializations	1	9
High	1.04	3.82	The presence of blogs, videos, and email facilitates the process of linking these technologies to the course topics.	2	13
High	1.08	3.94	Use the strategy of videos and short clips in artificial intelligence techniques facilitate the opportunity to access the computer courses offered by other universities	3	5
High	0.97	3.62	Services provided through artificial intelligence techniques contribute to supporting the elements of the educational environment	4	19
High	1.02	3.87	Artificial intelligence technologies facilitate the integration of the use of face-to-face and remote application system tools	5	8

deviation of (0.53), paragraph (13) came in first place, which states: "Artificial intelligence

High	1.06	3.70	Artificial intelligence technologies support the level of development of services provided on the Internet	6	18
High	0.93	4.09	AI applications have facilitated full-time or part-time online education service.	7	2
High	1.16	3.74	Classrooms have introduced specifications on the Internet and the presence of artificial intelligence technologies	8	15
High	1.03	3.86	Artificial intelligence technologies provide the service of redesigning and structuring educational and learning content to be presented online	9	10
High	0.96	3.79	Chats, wikis, forums, and survey surveys define AI services	10	14
High	1.26	3.50	Service accepts new roles and responsibilities from the obstacles of artificial intelligence technologies	11	20
High	1.14	3.97	Working with new technology has not been accepted	12	4
High	0.86	4.26	AI technologies provide educational services (patterns, learning, planning and induction)	13	1
High	0.99	3.99	AI capabilities are not equivalent in the implementation of some services related to human intelligence	14	3
High	1.05	3.89	The services provided by artificial intelligence technologies contradict the nature of traditional services carried out by humans (planning,	15	7

			learning, logical thinking, problem solving, knowledge, perception, movement and processing, social intelligence and creativity).		
High	1.08	3.70	Helps a machine or system understand, learn and act acceptably.	16	17
High	1.08	3.85	AI technologies facilitate drag and add procedures.	17	11
High	1.01	3.90	Artificial intelligence techniques help to challenge the educational difficulties of different courses	18	6
High	0.96	3.83	Artificial intelligence techniques in the educational aspect contribute to the development of sequencing to reduce traditional errors that may occur	19	12
Medium	1.05	3.73	Artificial intelligence technology contributes to linking course topics with the advantages of employing AI-based technologies in the types of services provided to them at the university.	20	16
High	0.53	3.85	Average		

technologies provide educational services (patterns, learning, planning and induction)." It came with an arithmetic mean of (4.26) and a standard deviation of (0.86) and a high-grade score, and paragraph No. (11), which states "artificial intelligence technologies facilitate withdrawal and addition procedures", came in last place with an arithmetic mean of (3.50), a standard deviation of (1.26) and an average grade score.

The T test was applied to independent samples to identify the role of artificial intelligence techniques in improving the quality of educational services, and the following table shows this:

Table (3)



Test (T) for independent samples to identify the role of artificial intelligence techniques in improving the quality of educational services

Statistical significance SIG	Degree of Freedom DF	Value T	Standard deviation	Average	N
0.001	217	106.676	.53227	3.8456	218

It appears from the table that there is a role for artificial intelligence techniques in improving the quality of educational services, as the value of t (106.676) and a probability indication of (0.001), which is a high value and statistically significant and indicates the active role of artificial intelligence techniques in improving the quality of educational services.

The results of the study showed that the role of artificial intelligence techniques in improving the quality of services provided to students came to a high degree, which indicates that the great role of artificial intelligence techniques in improving the quality of educational services provided to students of private universities in Jordan, and the researcher attributes the reason for this to the positive orientation by professors to modern technologies, as it is based on technological elements that facilitate requirements and provide multiple services that previously required time and long procedures because they are accomplished in traditional ways, and therefore modern technology It saved time and effort in obtaining multiple services, as well as overcoming the rigidity and boredom they suffer from when dealing traditionally with the services provided to them at the university through employees, including services related to admission, registration, withdrawal and addition, personal data, information about university courses and plans, and paper transactions.

The result of the current study is consistent with the result of Saad (2023), which found that the level of importance of artificial intelligence technology was high, and Al-Masri's study (2022), which concluded that the employment of artificial intelligence technologies at the



University of Jordan from the point of view of its students came in an average degree. There is also a role for the fields of artificial intelligence in improving the quality of student services, as well as the study of Al-Shawawra (2019), which showed that the quality of educational services was at a good level, and Petruzzellis, Duggento & Romanazzi, (2016) conducted a study that found that the quality of services provided to them does not live up to the required level with regard to electronic services, and also agreed with the study of Seif, Sartawi and Al-Aqraa (2014), which concluded that students' evaluation of the quality of services and their satisfaction was average, and to The existence of an impact of the quality of services on satisfaction, as agreed with the result of Shah & Yaqoob (2013), which stated that electronic services in dimensions (reliability, guarantee) came at a high level.

The results related to the second question, which states: "Are there statistically significant differences ($\alpha = 0.05$) in the role of artificial intelligence techniques in the level of educational services provided to students of private universities in Jordan from the point of view of their professors according to variables (gender, academic rank, and years of experience)?

To answer this question, the arithmetic averages and standard deviations of all study variables were extracted, and the triple variance analysis (3-way ANOVA) was applied to find out the extent to which there are differences in the role of artificial intelligence techniques in the level of educational services provided to students of private universities in Jordan from the point of view of their professors according to variables (gender, academic rank, and years of experience), and tables (4) show this:

Table (4)

Arithmetic averages and standard deviations of gender and academic rank variables, and years of experience

الانحراف المعياري	المتوسط الحسابي	العدد	level	Variable
0.45	3.88	33	male	Gender
0.55	3.84	185	female	
0.53	3.85	218	Total	
0.52	3.82	176	Teacher	Academic rank
0.58	3.94	42	Professor	
0.53	3.85	218	Total	
0.52	3.81	130	Less than 10 years	Experience years
0.54	3.89	88	More than 10 years	
0.53	3.85	218	Total	

It appears from the table that there are apparent differences in the role of artificial intelligence techniques in the level of educational services provided to students of private universities in Jordan from the point of view of their professors according to variables (gender, academic rank, and years of experience) and to identify the sources of differences, the triple variance analysis test (3-way ANOVA) was applied, and the following table shows that:

Table (4).

3-way ANOVA analysis to identify sources of differences according to gender variables, academic rank, years of experience (n=218)

Partial Eta	SIG	value F	Average squares	Differences of freedom	Sum of squares	Sources of differences
.002	.546	.366	.104	1	.104	Gender
.003	.426	.637	.181	1	.181	Academic rank
.001	.663	.191	.054	1	.054	Experience years
			.285	214	60.887	Error
				217	61.478	Total average



It appears from the table that there are differences in the opinions of the study sample members about the role of artificial intelligence techniques in the level of educational services provided to students of private universities according to gender variables and in favor of "males" with an arithmetic mean (3.88) and a standard deviation (0.45), and perhaps the reason for this is that males use technology more than females, and according to the academic rank variable in favor of "Professor Dr." with an arithmetic mean (3.94) and a standard deviation (0.58), and according to years of experience in favor of "10 years or more" with an arithmetic mean (3.89) and a standard deviation (0.54), and these two results explain that there is a continuous and intensive use of technology due to the tasks carried out by the faculty member during the period of service at the university and the duration of dealing with the technology significantly and directly.

The result of the current study differs with the result of Saad's study (2023), which showed that there are differences according to the variable (gender) in favor of females, as well as with the result of the study of Al-Masry (2022), which indicated that there are no differences in the quality of services provided to students due to the gender variable, and also differed with the result of the study of Seif, Sartawi and Al-Aqraa (2014), which indicated that there are statistically significant differences attributed to sex and in favor of females.

Summary of the results:

- There is an active role for artificial intelligence techniques to improve the quality of educational services provided to students of private universities in Jordan in non-fields.
- Artificial intelligence technologies provide students with various educational services for students.
- The application of artificial intelligence techniques has facilitated a full-time or part-time online education service.



- There are differences in the opinions of the study sample members on the role of artificial intelligence techniques in the level of educational services provided to students of private universities according to the gender variable and in favor of "males.
- There are differences in the opinions of the study sample members about the role of artificial intelligence techniques in the level of educational services provided to students of private universities according to the academic rank variable in favor of "professor".
- There are differences in the opinions of the study sample members on the role of artificial intelligence techniques in the level of educational services provided to students of private universities according to years of experience in favor of "10 years or more".

Recommendations:

In light of the findings, the researcher recommends the following:

- Increase interest in artificial intelligence techniques.
- Holding continuous workshops and conferences on raising awareness of the importance of keeping pace with modern technological developments and their reflection on various services.
- Ensuring the introduction of technologies in university services to keep pace with the rapid development of artificial intelligence.
- Overcoming obstacles related to accepting new roles and responsibilities through artificial intelligence techniques.
- Developing the services provided through artificial intelligence technologies and developing them continuously.
- Conduct other comparative studies involving a larger sample.



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