The Effects of Implementing Artificial Intelligence Systems on Enhancing Educational Services' Quality from the Perspective of Employees at Alzaiem Alazhari University-Sudan

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Abstract

Artificial intelligence (AI) broadly refers to any human-like behavior displayed by a machine or system. The purpose of this study was to understand how artificial intelligence may enhance educational services. A questionnaire was used to collect data from 80 randomly selected members of the teaching staff who work at Alzaiem Alazhari University in the academic year 2021–2022. The data was analyzed using the descriptive approach. The results showed that using AI significantly enhanced the standard of educational services. Based on the findings, it is recommended the implementation of AI and other modern systems in the academic and professional programs at the university.

Introduction

The present era has witnessed rapid changes and great challenges in the world of business, and the sciences have intertwined until they have become a homogeneous, interconnected structure. The information revolution, progress in information and communications technology, the spread of the global communications network, the Internet, and the many variables and rapid developments it has produced have a major Effect on the efficiency of the organizations' work and their achievement of their goals, which It brought about a fundamental and radical change in the methods of implementing its activities and operations.

Information technology in general and communications in particular are no longer merely tools that contribute to the process of modernization and modernization of societies and countries, but they are also one of the most important basic focal points and the mainstay of the information industry, just as the administrative industry was the mainstay of the previous stage. This is why the picture of the great development and transformation that has occurred and affected various sectors and activities has become clear. The overlapping development of communications with the development of computerized information systems and networks culminated in the emergence of a new term, artificial intelligence systems, which came to fit these modern technical developments.

Quality in higher education institutions is one of the requirements that contribute to the development of educational systems. Given the need for education to keep pace with developments occurring in all sectors of society, and for universities to adopt clear

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administrative systems, the available means can be adopted through which these activities can be developed and strengthened for the better.

The Study Problem

The rise of information technology and computer systems has sparked a growing fascination with integrating modern technologies, such as artificial intelligence systems, into higher education institutions. This interest is supported by a study conducted by Al-Ghamdi and Al-Farani (2020), which highlights the significance of incorporating educational applications for artificial intelligence. This finding is further reinforced by the research conducted by Kabdani and Baden (2021). There is no text provided. The utilization of artificial intelligence applications is currently regarded as a top priority, with a requirement for implementation across all fields of expertise. This may potentially enhance the quality of educational services, as evidenced by the study conducted by Gibran et al. (2020), which revealed an average level of educational service quality. Additionally, the study by Al-Haddabi and Okasha (2020) indicated that the provided educational services fall short of students' expectations, as further confirmed by the same study. (Haas and Ali, 2020) suggest that there are shortcomings in the attributes of educational service quality, thus the implementation of an artificial intelligence system could impact the quality of educational services in higher education institutions. To elucidate this matter, the issue of the investigation can be articulated in the subsequent primary inquiry: What is the effect of utilizing artificial intelligence systems on the quality of educational services provided by universities?

Several sub-questions branch out from this question, as follows:

1. What is the actual state of artificial intelligence systems and the level of educational services provided by universities?
2. Does the use of expert systems have an impact on enhancing the quality of educational services provided by universities?
3. Does the use of decision support systems have a positive impact on enhancing the quality of educational services provided by universities?
4. Does the implementation of neural networks have an impact on enhancing the quality of educational services provided by universities?

The Importance of Studying

The importance of the study is highlighted through two basic dimensions:

Scientific importance: The lack of studies that dealt with artificial intelligence and the quality of educational service in the Arab and Sudanese libraries in particular, the novelty of the subject of the study and its rarity according to the knowledge of the researcher in the Arab library.

Practical importance: The importance of using artificial intelligence and its role in improving the quality of educational service in higher education institutions, contributing to improving the quality of educational services at Al-Zaim Al-Azhari University according to the results reached by the study and benefiting from them in applied aspects.

Objectives of the Study

The primary goal of this study is to improve the quality of educational services using artificial intelligence applications by achieving the following goals:

- Identifying the reality of artificial intelligence systems and the quality of educational services at the university.
- Identify the impact of using expert systems in improving the quality of educational services at the university
- Explaining the impact of using decision support systems in improving the quality of educational services at the university
- Explaining the impact of using neural networks in improving the quality of educational services at the university
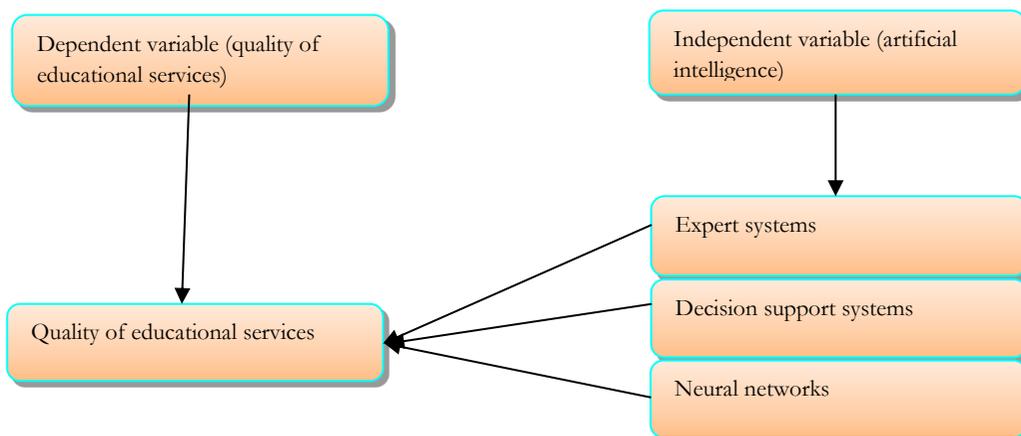
Study Hypotheses

The study seeks to test the following main hypothesis: There is a statistically significant effect of using artificial intelligence systems in improving the quality of educational services at the university. The following sub-hypotheses branch out:

1. There is a statistically significant effect of using expert systems in improving the quality of educational services at the university
2. There is a statistically significant effect of using decision support systems in improving the quality of educational services at the university
3. There is a statistically significant effect of using neural networks in improving the quality of educational services at the university

Study Model

To achieve the purpose of the study and reach its specific objectives in determining the effect of the independent variable (artificial intelligence) on the dependent variable (quality of educational services), the study model was formulated, as shown in Figure (1).

Figure (1) Study Model.

Source: Prepared by the Researcher, 2022 AD.

Study Methodology

The study follows the descriptive analytical method, and the study also uses the historical method.

Sources and Tools for Collecting Study Data

The study relies on primary sources: a questionnaire is used to collect data, in addition to secondary sources: books, scientific research, studies, reports, magazines and newspapers, seminars and conferences related to the subject of the study.

The Limits of the Study

The study was limited to the following limits:

- Spatial boundaries: Al-Zaim Al-Azhari University - Sudan.
- Time limits: Academic year 2021-2022 AD.
- Human Frontiers: Faculty members at Al-Zaim Al-Azhari University - Sudan.

Previous Studies

Some studies in this field can be listed as follows:

Study by Salah Al-Din and Al-Bartmani (2018): The study aimed to find proposed mechanisms to achieve the quality of university services at the Center for Community Service and Continuing Education at Sultan Qaboos University using a measure of the gap between perceptions and expectations. The study used the descriptive approach. The study population represented the Center for Continuing Education at Sultan Qaboos University. A random sample of (101) was taken from the academics, employees of the center and trainees. The study concluded that the quality level of the services actually provided and the services expected from the center are of a high level, with Statistically significant differences attributed to demographic variables.

Study by Gibran et al., (2020): The study aimed to know the level of quality of educational services at Sana'a University from the point of view of graduate students. The study used the descriptive survey method. The study population included all graduate students (Master's, Doctorate) during the period from (2016-2018 AD). A simple random sample of (185) postgraduate students at Sana'a University was selected. The results of the study concluded that the level of quality of educational services at Sana'a University from the point of view of postgraduate students as a whole was average.

Study by Al-Haddabi and Okasha, (2020): The study aimed to reveal the factors contributing to the quality of educational services provided to students in Yemeni universities and then determine the level of quality of educational services provided to them in the various fields of service. The study followed the descriptive analytical approach. The study population represented students at Sana'a University. The study sample consisted of (300) male and female students studying in colleges and various levels at the university during the year (2006-2007). The results of the study concluded that the level of quality of service provided to students did not meet what students expected.

Study by Hassan and Ali, (2020): The study aimed to identify the role played by the concept and characteristics of knowledge transfer in enhancing the contents of the quality of educational service. The study followed the descriptive and analytical approach. The study population represented the University of Tikrit, and the study sample consisted of (100) faculty members at the University of Tikrit. The study concluded that educational quality is an important input for the growth of educational organizations because of its significant impact on improving educational outcomes represented by students, and that there is a deficiency in some characteristics of the quality of educational services, especially mutual trust between the teaching staff and the educational service staff.

Study by Al-Ghamdi, Al-Farani, (2020): The study aimed to identify the reality of special education teachers' use of educational applications of artificial intelligence and the trend towards them from the point of view of teachers at Al-Noor Institute in Jeddah Governorate. The study used the descriptive approach. The study sample consisted of (27) female teachers from Al-Noor Institute, who were selected through a purposive sample from the study population. The results of the study showed that the axis of the importance of using educational applications for artificial intelligence received a score of (strongly agree) from the educational teachers. Private. The focus of the trend towards the use of educational applications for artificial intelligence is (OK).

Study by Kabdani and Baden, (2021): The study aimed to determine the relative importance of using artificial intelligence applications in Algerian higher education institutions and their role in ensuring the quality of education in light of recognized international standards. The study used the descriptive analytical method. The study population consisted of various Algerian universities. A sample of (109) individual university professors was selected. The study concluded that the use of artificial intelligence applications in Algerian higher education institutions is considered a priority at the present time at a rate of more than 81%, and that there is an urgent need to use this application with all scientific disciplines, including scientific and humanities.

What Distinguishes the Current Study from Previous Studies

Previous studies contributed to building preliminary perceptions for the current study and forming an accurate perception regarding artificial intelligence systems as an independent variable, such as the study of Al-Ghamdi, Al-Farani, 2020, (Kabdani and Baden, 2021), and the study of (Salah Al-Din, and Al-Bartmani, 2018), the study of (Gibran). et al. (2020), the study (Al-Haddabi and Okasha, 2020), and the study (Hassan and Ali, 2020) in building a perception about the dependent variable, the quality of educational services. The researcher also benefited fromThe results reached by previous studies indicate the extent of their agreement or disagreement with the current study.

This study was distinguished from previous studies in that it focused on artificial intelligence systems and their role in improving the quality of educational services from the point of view of faculty members at Al-Zaim Al-Azhari University - Sudan.

First: The Theoretical Framework

1. Artificial Intelligence

Artificial intelligence is a discipline of computer science that focuses on the study and development of computer systems capable of exhibiting intelligent behavior.Some examples of

intelligence encompass systems capable of acquiring new concepts and skills, systems capable of reasoning and making valuable deductions about our environment, and systems capable of comprehending natural languages. Furthermore Perceives and comprehends visual environments, as well as systems capable of executing activities that necessitate human involvement intelligence (Al-Rutmi, 2012).

According to Makkawi (2018), it can be characterized as the capacity to acquire knowledge, comprehend, resolve issues, and make judgments. According to Al-Yajzi (2019), cognitive capability in 2019 refers to the capacity to carry out a mental task at a level equivalent to that of a human. According to Moussa (2019), it is a field within computer science that focuses on the development of software programs. Capable of executing tasks that necessitate the cognitive abilities typically associated with intelligent individuals, such as logical reasoning, acquiring knowledge, and adaptability. In his study, Mahmoud (2020) highlighted that this field of computer science focuses on developing sophisticated techniques to train computers to execute actions and draw conclusions that closely resemble, but within limited boundaries, the unique abilities of human cognition. Cognitive abilities of human beings. (Al-Mansouri and Al-Tahitah, 2021) stated that computer modeling involves the capacity to depict and analyze the fundamental connections among the parts of a certain domain, and subsequently devise suitable responses to the events and circumstances inside that domain.

The researcher can define artificial intelligence as: a computer application concerned with building programs capable of studying and implementing repetitive activities performed by humans.

(Kabdani and Baden, 2021) argue that artificial intelligence seeks to comprehend the intricate cognitive processes carried out by the human mind during the act of thinking. Subsequently, it aims to convert these mental processes into analogous procedures that enhance the computer's capacity to tackle intricate problems. This is achieved through the utilization of top-notch artificial intelligence systems, which encompass:

Expert systems: (Al-Ghamdi and Al-Farani, 2020) stated that it is a computer-based information system that develops solutions to problems related to a specific system, and it is called a system and not a program because it should include components that solve the problem and others that support the work, and these components form the support environment that helps the user. To interact with the system and may include highly sophisticated aids to detect malfunctions or predict future events based on scientific foundations, and it also includes capabilities to facilitate the user's dealings with it while operating the system. The researcher believes that expert systems contain comprehensive knowledge of the field of interest, the application of research methods, support for exploratory analysis, the ability to infer new knowledge from existing knowledge, symbolic operation, and the ability to explain reasons.

Decision support systems: (Al-Mansouri and Al-Tahitah, 2021) believe that they are systems based on the use of computers, as the mental capabilities of the individual are integrated with the computational capabilities of the computer for the purpose of improving the quality of the decision, and they are systems based on the use of the computer to support administrative decision makers in dealing with semi-typical problems. The researcher believes that they are computer and interactive information systems, which are a combination of information technology and communications networks, in order to achieve, at the end of their application, providing assistance in the decision-making process and providing possible solutions to

problems with the aim of estimating the alternatives available to the administration. They are systems that work to process data, model problems, and mix solutions instead. To meet the need for information.

Neural networks: (Moussa and Bilal, 2019) indicated that it is a mechanism for processing data in a way that mimics and resembles the way in which the natural neural networks of a person or living organism, i.e. the human nervous system, perform it. (Mahmoud, 2020) believes that they are computational techniques designed to simulate the way in which the human brain performs a specific task, through massive processing distributed in parallel, and composed of simple processing units. These units are nothing but computational elements that have a neural characteristic, as they perform... By storing (Nodes, Neurons) Practical knowledge and experimental information are called neurons to make them available to the user by adjusting the weights. The researcher believes that it is an artificial intelligence technology that operates information based on a computer, inspired by the study of the human mind.

2. Quality of Educational Services

Majeed (2014) stated that the concept of quality in education has two interconnected meanings, one realistic and the other sensory. Quality of education in its realistic sense means the educational organization's commitment to achieving real, recognized indicators and standards such as the cost rates of university education. As for the sensory meaning of education quality, it is based on the feelings and sentiments of the recipients of the educational service. Such as students and their parents.

Al-Hariri believes that the importance of quality in education is summarized as follows: (Al-Hariri, 2015):

- Controlling and developing the administrative system in the educational organization.
- Improving the level of students in all fields.
- Controlling and reducing complaints from students and stakeholders and developing solutions.
- Increasing educational competence and raising the level of performance of the organization's employees.
- Fulfilling the requirements of students, stakeholders, and society, and achieving their satisfaction in accordance with the general system of educational organizations.
- Enabling the educational organization to analyze problems using scientific methods.
- Raising the level of students and stakeholders towards the educational organization by highlighting commitment to the quality system.
- Interconnection and integration between all teachers and administrators in the organization and work in a team spirit.
- Implementing a quality system gives the educational organization respect, local appreciation, and local recognition.

(Hassan and Ali, 2020) believe that in higher education, processes are characterized by renewal due to the service provider's direct interaction with its recipient, which enhances the response to the reactions of those services by its recipient. (Gibran et al., 2020) stated that one of the most important keys to quality in education is that the service is designed based on the capabilities of its provider, as the term concurrent engineering is sometimes used, as service production managers and designers work together (closely) in the early stages of product design

to ensure that production requirements are Synchronized with operations capabilities, to reach a better quality level in a short time. There are also many approaches to improving the quality of educational services in higher education institutions, including:

- The approach to service reliability: (Al-Haddabi and Okasha, 2020) see it as the strength, stability, and integration of quality in higher education, and enhancing confidence through private (internal) and external oversight in accordance with the reality of educational organizations and bearing full responsibility for the processes of continuous measurement and application of quality in higher education. Its commitment and hard work endeavors to move towards excellence and reach the stage of quality and accreditation.
- Introduction to educational administration development: creating and managing resources and conditions leading to achieving the quality of the educational process using the best technology (Muhaibas and Abdul Hussein, 2020).
- The approach to reducing waste: (Salah Al-Din and Al-Bartmani, 2018) indicated that it aims to reduce waste in all educational systems and processes, and maximize the benefit, such as reducing (time, information, cost).
- Introduction to empowering faculty members electronically: (Kabdani and Baden, 2021) stated that it is unleashing one's abilities in teaching and learning and in order to be empowered, one must keep pace with these changes and one must possess additional skills such as mastering a set of practical skills in producing (educational) means, operating them, and using them. Audio-visual machines and devices in teaching his students and employing them appropriately in the educational process.

Second: Field Study

1. Methodological Procedures of the Study

- Study population and sample: The study population consists of (437) faculty members at Al-Zaim Al-Azhari University.
- The study sample was selected randomly, consisting of (100) faculty members, representing 22.9% of the original community. The researcher distributed (100) questionnaires, and (80) valid questionnaires were retrieved for analysis, i.e. (80%).
- Statistical methods employed: The questionnaire data was transcribed and analyzed using the Statistical Package for the Social Sciences (SPSS), utilizing the following statistical procedures:
- Descriptive statistical analysis tools were employed to characterize the study sample and its patterns. These tools included the calculation of arithmetic means, standard deviations, and relative weights.
- (Cronbach's alpha) test (Cronbach's Alpha) to determine the reliability of the questionnaire items.
- Spearman-Brown equation to identify internal consistency between the study axes.
- Regression Analysis: Simple regression analysis was used to determine the effect of the independent variable on the dependent variable.

Validity and Reliability of the Instrument

To test the validity and reliability of the tool, the researcher presented the questionnaire to a number of (7) arbitrators who made some comments on its paragraphs. The questionnaire was

also tested after distribution in order to ensure the validity of the questionnaire's contents by measuring the reliability of the questionnaire, by measuring internal consistency, and for this purpose. The Crombach Alpha scale was used at the level of the artificial intelligence axis and the quality of educational services, while the alpha coefficient reached (80%) at the level of the two main dimensions. These percentages are considered acceptable in descriptive measures. Correlation coefficients were also calculated between the study variables to each other to identify The strength of the internal consistency between the study axes and Table (1) shows the internal consistency of the study variables. .

Table (1): Internal Consistency of the Study Variables.

	Expert Systems	Decision Support Systems	Neural Networks	Quality Of Educational Services
Expert systems	1			
Decision support systems	0.769**	1		
Neural networks	0.541**	0.745**	1	
Quality of educational services	0.612**	0.744**	0.811**	1

It is noted from the data in Table (1) that all correlation coefficients are statistically significant at the significance level (0.01), which indicates internal consistency between the questionnaire's axes, which confirms the validity of the questionnaire and its suitability for use and application.

2.Study Results, Discussion and Interpretation

This section entails an examination of the research's dimensions in order to facilitate a discussion of its hypotheses. This involves extracting the arithmetic means, standard deviations, and relative weight of the study regions in the following manner:

The First Axis: Artificial Intelligence

To know the level of artificial intelligence at the university under study, I calculated the arithmetic means, standard deviations, relative importance and ranking to know the opinions of the study sample members about the paragraphs and axes of artificial intelligence, as shown in Table (2).

Table (2): Descriptive Statistics of Respondents' Agreement on the Dimensions of Artificial Intelligence.

M	The Dimension	Sma	Standard Deviation	Relative Importance	Rank	Level Relative to the Arithmetic Mean
1	Expert systems	3.983	0.976	0.797	3	High
2	Decision support systems	4.259	0.850	0.852	2	High
3	Neural networks	4.639	0.675	0.928	1	High
Overall arithmetic average		4.294	0.834	0.859		High

According to Table (2), the average value of the independent variable (artificial intelligence systems) for the replies of the study sample is 4.294, with a relative weight of 85.9%. This signifies a significant degree of concurrence. The value of the standard deviation is 0.834, which signifies... The responses from the study sample demonstrate a significant degree of

uniformity about the feasibility of implementing the artificial intelligence system. With respect to the dimension aspect, the results were as follows: It obtained the highest position, exceeding neural networks, with an average of 4.639, which is greater than the overall average of 4.294, and a standard deviation of 0.928. The dimension of expert systems was rated third, with an arithmetic average of 3.983, which is lower than the total arithmetic average of 4.294. The expert systems have a standard deviation of 0.797, which suggests a low level of dispersion. These findings indicate that the sample members share similar perspectives on the various aspects of Artificial Intelligence systems at the institution. The results are consistent with the studies carried out by Al-Ghamdi, Al-Farani (2020) and Kabdani and Baden (2021), which showcased the present use of artificial intelligence applications.

The Second Axis Quality of Educational Services

To know the level of quality of educational services at the university under study, I calculated the arithmetic means, standard deviations, relative importance and ranking to find out the opinions of the study sample members about the items in the quality of educational services, as shown in Table (3).

Table (3): Descriptive Statistics of Respondents' Agreement on the Dependent Variable: Quality of Educational Services.

M	The Dimension	Sma	Standard Deviation	Relative Importance	Rank	Level Relative to the Arithmetic Mean
1	Increased reliability	4.466	0.775	0.893	2	High
2	Development of educational administration	4.575	0.756	0.915	1	High
3	Reduce time wastage	4.359	0.868	0.872	4	High
4	Empowering faculty members electronically	4.388	0.824	0.878	3	High
	Overall arithmetic average	4.447	0.806	0.889	-	High

The table (3) displays the statistical measures of the quality of educational services. The dependent variable has an arithmetic mean of 4.447, a standard deviation of 0.806, and a relative importance of 88.9%. After analyzing the data on educational administration, it was found that the dimension of decreasing time wastage had the lowest ranking. This dimension had an arithmetic mean of 4.359, a standard deviation of 0.868, and a relative value of 91.5%, and a relative importance of (87.2%). Furthermore, it is seen that there exists a disparity in the mean values of the items pertaining to the dependent variable, quality. All respondents had a positive impression of the educational services provided. The findings align with the research conducted by Salah Al-Din and Al-Bartmani (2018), which demonstrated a high level of service quality at the center. However, they contradict the findings of both Jibran et al. (2020), who reported a moderate level of educational service quality, and Al-Hadabi and Okasha (2020). The study conducted by Hassan and Ali (2020) revealed a deficiency in the characteristics pertaining to the quality of educational services at the institution.

3. Testing the Study Hypotheses

In order to test the hypotheses, adjustments were made to multiple regression models. The independent variable considered was artificial intelligence and its dimensions, including expert systems, decision support systems, and neural networks. The dependent variable was the quality of educational services. The purpose was to determine whether each independent variable had

an effect on the dependent variable.

Main hypothesis: There is a statistically significant effect of using expert systems in improving the quality of educational services

To test this hypothesis, a regression analysis was conducted to ensure the validity of the model by measuring the effect of the combined dimensions of artificial intelligence on the quality of educational services, as shown in Table (4).

Table (4): The Effect of the Combined Dimensions of Artificial Intelligence on the Quality of Educational Services.

Independent Variable	Regression Coefficients	Test Valuet	Probability Valuesig
Fixed variable	0.911	2.79	0.0007
artificial intelligence	0.835	10.87	0.000
Correlation coefficient = 0.776		Coefficient of determination = 0.602	
Test valueF = 118.14		Probability value =0.000	

From Table (4) it is clear that there is a statistically significant effect of artificial intelligence as a separate (explanatory) factor on the standard of instruction services as a dependent (responding) variable, and this effect is supported by the value of (The calculated F) is (118.14), which is greater than the tabulated value at the level of significance (0.000). This means that there is an effect of (artificial intelligence) on the dependent variable (quality of educational services), which indicates the regression curve effectively characterizes the correlation between the two variables, as the estimates indicated There was a direct correlation between the two variables amounting to (0.776), and the value of the coefficient of determination (R^2) for artificial intelligence was (0.602). This means that 60.2% of the variance occurring in the standard of instruction provided is variance explained by artificial intelligence, and that 39.8% is variance. explained by other factors that did not enter the regression model. Based on the previous model estimates, the study hypothesis can be accepted, which states (there is a statistically significant effect of artificial intelligence on the quality of educational services).

The First Sub-Hypothesis: *There is a statistically significant effect of using expert systems in improving the quality of educational services*

As indicated in Table (5), a straightforward regression analysis was carried out to gauge the impact of expert systems on the caliber of educational services in order to evaluate this claim.

Table (5): The Impact of Expert Systems on the Quality of Educational Services.

Independent Variable	Regression Coefficients	Test Valuet	Probability Valuesig
Fixed variable	2.142	6.33	0.000
Expert systems	0.573	6.83	0.000
Correlation coefficient = 0.621		Coefficient of determination = 0.374	
Test valueF = 46.63		Probability value =0.000	

Table (5) demonstrates a statistically significant impact of expert systems as a separate factor influencing the standard of instruction services as a dependent variable. This effect is supported by the calculated F value of 46.63, which exceeds the tabular value at a significance level of 0.000. This implies that the presence of expert systems has an impact on the dependent

variable, which is the quality of educational services. This suggests that the regression curve effectively describes the relationship between these two variables, as indicated by the estimates. A clear and strong relationship was seen between the two variables, with a correlation coefficient of 0.621. The coefficient of determination (R^2) for the expert systems was 0.374. This indicates that 37.4% of the variability observed in the quality of educational services can be attributed to the influence of expert systems, while the remaining 62.6% of the variability is attributed to other factors that were not included in the regression model. According to the previous model estimations, the study hypothesis can be confirmed, which asserts that there is a statistically significant impact of expert systems on the quality of educational services.

The Second Sub-Hypothesis: *There is a statistically significant effect of using decision support systems in improving the quality of educational services*

To test this hypothesis, a simple regression analysis was conducted to measure the effect of decision support systems on the quality of educational services, as shown in Table (6)

Table (6): The Impact of Decision Support Systems on the Quality of Educational Services.

Independent Variable	Regression Coefficients	Test Valuet	Probability Valuesig
Fixed variable	1.234	3.89	0.000
Decision support systems	0.749	10.14	0.000
Correlation coefficient = 0.744		Coefficient of determination = 0.569	
Test valueF = 102.80		Probability value =0.000	

The data from Table (6) indicates a significant impact of decision support systems as an independent variable on the quality of educational services as a dependent variable. This impact is supported by the calculated F value of 102.80, which exceeds the tabulated value at a significance level of 0.000. This implies that decision support systems have a significant impact on the dependent variable, which is the quality of educational services. This suggests that the regression curve effectively describes the relationship between these two variables, as it has been described. Estimates suggest a clear and direct relationship between the two variables, with a correlation coefficient of 0.744. Additionally, the coefficient of determination (R^2) for decision support systems is 0.569. This indicates that decision support systems account for 56.9% of the variability observed in the quality of educational services, while the remaining 43.1% can be attributed to other factors not considered in the regression model. According to the previous model estimations, the study hypothesis can be confirmed, which asserts that there is a statistically significant impact of decision support systems on the quality of educational services.

The Third Sub-Hypothesis: *There is a statistically significant effect of using neural networks in improving the quality of educational services*

To test this hypothesis, a simple regression analysis was conducted to measure the effect of neural networks on the quality of educational services, as shown in Table (7)

Table (7): The Impact of Neural Networks on the Quality of Educational Services.

Independent Variable	Regression Coefficients	Test Valuet	Probability Valuesig
Fixed variable	0.661	2.13	0.030

Neural networks	0.811	12.23	0.000
Correlation coefficient = 0.811		Coefficient of determination = 0.657	
Test valueF = 149.58		Probability value =0.000	

Table (7) demonstrates a statistically significant impact of neural networks as an independent variable on the quality of educational services as a dependent variable. This effect is supported by the calculated F value of 61.571, which exceeds the tabulated value at a significance level of 0.000. This implies that neural networks have an impact on the dependent variable, which is the quality of educational services. This suggests that the regression curve effectively describes the relationship between these two variables, as indicated by the estimates. A clear and strong relationship existed between the two variables, with a correlation coefficient of 0.579. The coefficient of determination ($R2$) for the neural networks was 0.426. These findings indicate that neural networks account for 42.6% of the variability in the quality of educational services, while the remaining 57.4% is attributed to other characteristics not included in the regression model. According to the previous model estimations, the study hypothesis can be confirmed, which asserts that there is a statistically significant impact of neural networks on the quality of educational services.

Third: Results, Recommendations and Proposals

Results

The most important conclusions reached by the study can be summarized as follows:

- Variation in the level of use of artificial intelligence systems, but all averages in terms of respondents' perceptions were high.
- There is a high level of quality of educational services at the university, with relative importance reaching (88.9%).
- The results of the study showed a statistically significant effect of using artificial intelligence systems combined in improving the quality of educational services at the university.
- The results of the study showed a statistically significant effect of using expert systems in improving the quality of educational services at the university
- The results of the study indicated that there is a statistically significant effect of using decision support systems in improving the quality of educational services at the university
- The results of the study demonstrated that there is a statistically significant effect of using neural networks in improving the quality of educational services at the university

Recommendations

Based on the results of the study, the researcher recommends the following:

1. Working to adopt artificial intelligence systems as an input to improve the quality of educational service at the university.
2. Increasing attention to the dimensions of the quality of educational services by adopting modern and advanced methods in the university's educational and professional programs.
3. Relying on artificial intelligence systems to ensure the transfer of expertise on the one hand and keeping pace with rapid technical developments on the other hand to improve the quality of educational service at the university.
4. Benefiting from expert systems because of their ability to store rare human expertise specialized in improving the quality of educational service at the university.

5. Paying attention to neural network technology to save time and effort and improve the quality of educational service at the university.
6. Working to enhance the inputs of decision support systems to improve the quality of educational service at the university.

Proposals

The researcher suggests conducting the following studies:

1. The impact of the use of artificial intelligence systems on the performance of higher education institutions from the point of view of faculty members.
2. The impact of using artificial intelligence systems in achieving quality assurance in higher education institutions.
3. The impact of using artificial intelligence systems in improving the outcomes of higher education institutions.

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