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AI-Driven Performance Analytics for Educational Staff: An Empirical Study in Iraqi Schools

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Abstract

This quantitative study investigates the impact of AI-based decision support systems on teacher performance and administrative efficiency in Iraqi secondary schools. A structured questionnaire was administered to 350 teachers and administrators across four governorates (Sulaimaniyah, Nineveh, Baghdad, and Al-Nasr District). Data were analyzed using SPSS v25 through reliability tests (Cronbach's alpha), validity tests (Pearson correlation), descriptive statistics, and regression analysis. The results revealed a strong positive correlation between AI-based systems and teacher performance ($R = 0.939$, $R^2 = 0.875$, $p < 0.001$), indicating that 87.5% of the variance in teacher performance is explained by AI system use. Additionally, AI tools significantly improved administrative planning efficiency ($R^2 = 0.694$) and decision quality ($R^2 = 0.570$). Staff acceptance of AI technologies also showed a substantial impact on institutional performance ($R^2 = 0.642$). The study recommends promoting AI integration in schools, enhancing technological infrastructure, and providing training programs for educational staff. These findings offer evidence-based insights for policymakers seeking to modernize educational management through smart analytics.

1.Introduction

Despite ongoing efforts to improve educational outcomes in Iraqi schools **[2],** traditional teacher assessment methods remain inadequate. These methods predominantly rely on student examination scores, offering delayed and partial feedback on instructional effectiveness **[10].** Such limitations hinder timely interventions and evidence-based decision-making in educational management.

The integration of Artificial Intelligence (AI) in education has emerged as a promising solution to these challenges. AI-based performance analytics can provide real-time feedback, optimize resource allocation, and enhance institutional performance **[8].** However, most existing research focuses on student outcomes, with limited empirical investigation into how AI-driven systems affect teacher performance and administrative processes, particularly in developing countries like Iraq **[14].**

This study addresses this gap by examining the impact of AI-based decision support systems on educational staff in Iraqi secondary schools. Specifically, it investigates: **[1]** the relationship between AI system use and teacher performance, **[2]** quality, and **[4]** the role of staff acceptance in successful AI implementation. By providing empirical evidence from the Iraqi context, this research aims to inform policymakers and school leaders about the potential of AI-driven analytics to transform educational management.

2. Rationale for AI-Driven Performance Analytics in Education.

The integration of AI in educational management has gained increasing attention globally. AI-based performance analytics refer to the use of machine learning algorithms and data analysis techniques to evaluate, predict, and enhance the performance of educational staff **[3].** Unlike traditional assessment methods that focus primarily on student outcomes, AI-driven systems can provide comprehensive insights into teacher effectiveness, instructional quality, and administrative efficiency **[7].**

In the Iraqi context, the need for such systems is particularly acute. The education sector faces challenges including large class sizes, limited resources, and inconsistent teacher evaluation mechanisms **[16].** Enhancing teacher performance through AI-based analytics could lead to improved student outcomes and more effective resource allocation **[13].**

Recent international studies have demonstrated the potential of AI in education. For instance, **[15]** showed that integrating AI with learning analytics facilitates data-driven pedagogical decisions. Similarly, **[12]** emphasized that real-time data-driven teaching enables more responsive educational management. **[16]** further argued that AI serves as a catalyst for sustainable effectiveness in compulsory education management.

However, despite this growing body of evidence, limited research has examined AI applications in Iraqi schools. Most existing studies focus on higher education or remain theoretical. This study addresses this gap by providing empirical evidence on the impact of AI-based decision support systems on teacher performance and administrative processes in Iraqi secondary schools.

3. Methodology

This study adopts a quantitative research design to examine the impact of AI-based performance analytics on teacher performance in Iraqi secondary schools**.[5]** A quantitative approach is appropriate as it allows for the measurement of variables and statistical testing of hypotheses derived from theory. The research employs a cross-sectional survey design, **[9]** where data were collected at a single point in time **[4]** from a sample of educational staff across four Iraqi governorates.

3.1. Research Design.

This study employs a quantitative, cross-sectional survey design based on a positivist research philosophy. This approach is appropriate because the study aims to measure relationships between variables (AI-based decision support systems and staff performance) and test hypotheses using statistical methods. The cross-sectional design allows data collection at a single point in time, providing a snapshot of the current state of AI implementation in Iraqi schools. This design is widely used in educational research to identify patterns and relationships across a sample population **[6].**

3.2. Participants and Context

The study population consisted of teachers, principals, and education officials in Iraqi secondary schools. A multi-stage sampling strategy was employed to select participants from four out of 18 governorates: Sulaimaniyah, Nineveh, Baghdad, and Al-Nasr District. These governorates were selected to ensure geographic diversity, representing northern, central, and southern regions of Iraq.

The final sample comprised **350** respondents, including 210 teachers (60%), 85 school administrators (24.3%), and 55 education supervisors (15.7%). The sample included 198 males (56.6%) and 152 females (43.4%), reflecting the gender distribution in the Iraqi education sector. Participants' years of experience ranged from 1 to 35 years, with a mean of 12.4 years (SD = 8.2).

Data collection was conducted at the end of the 2022-2023 academic year (May-June 2023). Inclusion criteria required participants to be currently employed in secondary schools and have at least one year of experience. Participants were provided with a nominal honorarium for their contribution. Ethical considerations included informed consent, anonymity of responses, and the right to withdraw at any time.

3.3. Data Collection and Analysis

To ensure accuracy and objectivity in achieving the study's aims, the researcher prepared and utilized a questionnaire form. Recognizing the questionnaire as a primary technique commonly employed in scientific research to support such inquiries, data were collected from the study sample using this instrument to address the research questions and to identify respondents' current conditions and attitudes regarding their interest in, and engagement with, knowledge sharing and decision making. The questionnaire was crafted to align with the theoretical component of the study in an effort to test the theoretical framework against empirical reality **[11].**

3.4. Ethical Considerations.

This study adhered to standard ethical guidelines for educational research. All participants were informed about the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any time without consequences. Written informed consent was obtained from all respondents prior to data collection. Anonymity was guaranteed by using coded identifiers instead of names, and all data were stored securely with access restricted to the research team. The study protocol was reviewed and approved by the Anbar Education Directorate Research Ethics Committee (Approval No. AED-2023-17).

4. Findings

1-The reliability and validity tests demonstrated a high degree of reliability for the study instrument, with all Cronbach's alpha values exceeding 0.70. The overall reliability of the questionnaire was 0.978, confirming the dependability of the study's findings.

2-A middle to a high degree of application of AI-based decision support systems was found in Iraqi schools with an average score of between 3.26-3.46 that depicts a good degree of availability of AI-based decision support systems.

3-The outcomes also revealed the moderate or high level of staff performance with mean scores between 3.13 to 3.38 which depicts acceptable institutional performance which can be improved.

4-The linear regression analysis proved that there is a significant positive influence of AI-based decision support systems on teacher performance a correlation coefficient of 0.939 and coefficient of determination of 0.875, shown to be statistically significant, reveals that AI has a major role in improving performance.

5-Multiple regression analysis indicated that the size of decision support systems, especially ease of use, decision support, and data quality are significant to enhance the performance of teachers with a model interpretation rate of 90.2.

6-The findings proved the high positive effect of the implementation of artificial intelligence tools that enhances the effectiveness of administrative planning with an impact rate of 69.4, which proved the value of such systems in the administrating process development.

7-It was also found that the impact of using intelligent analytics as a means of improving the quality of administrative decisions was high, and the impact rate of 57, thereby making decisions accurate and more effective.
8-In addition, the findings also revealed that the acceptance of artificial intelligence technologies among employees significantly influences the performance of institutions and the degree of impact is 64.2, which is quite high, proving the value of the human factor in effective implementation of AI-based technologies.

5. Discussion

The findings of this research verify that AI-supported decision support systems can be considered in terms of high contribution to the performance of teachers and the effectiveness of institutions in Iraqi schools. The high level of statistical correlation (R 2 = 0.875, p=0.001) proves that AI-based analytics can generate precise and current data contributing to the better performance evaluation and wise decision-making in contrast to the conventional assessment tools.
The results further show that artificial intelligence technology helps in enhancing the administrative planning efficiency (R 2 = 0.694) and quality of decisions (R 2 = 0.570), which illustrates their significance in data-driven management. Moreover, AI technologies were observed to have a considerable effect on the performance of an institution with the help of the staff acceptance (R 2 = 0.642), as user readiness is the key to the success of the implementation. Overall, AI-driven decision support systems represent an effective strategic tool for improving educational staff performance, enhancing decision-making quality, and supporting the modernization of educational management in Iraqi schools.
While the findings demonstrate a strong statistical association between AI systems and performance indicators, it is crucial to acknowledge the limitations of the analysis. The cross-sectional design precludes any definitive claims about causality. The high R^2 values, although indicative of a strong model fit, should be interpreted with caution, as they may be influenced by the specific sample or the measurement instruments used. Unobserved variables, such as teacher motivation, prior training, or school leadership quality, could also contribute to the explained variance. Therefore, the results should be viewed as evidence of a significant relationship rather than proof of a direct causal effect.

6-Statistical methods used:

Data were exported via the Statistical Package for the Social Sciences (SPSS) IBM SPSS Statistics Version 25, and the following tests were employed:
1. Assessing reliability using Cronbach's alpha to evaluate the stability of the questionnaire. Test the validity through the Pearson correlation coefficient between dimensions and total questionnaire.
2. Provide descriptive statistics of the data by tabulating the results in terms of numbers, percentages, means, standard deviations, and percentile ranks (weights) for the questionnaire variables.
3. Correlation using the Pearson correlation coefficient to test the study hypotheses regarding validity.
4. A straightforward regression analysis is employed to examine how the independent variables affect the dependent variable in order to test the study hypotheses regarding validity.

This chapter delineates the procedures employed to assess the validity and reliability of the questionnaire items. It also outlines the principal results and findings for each hypothesis in relation to the data gathered and the research methodology described in the preceding chapter. A range of analytical methods is utilized to examine the collected data within the study. Statistics comprises techniques for describing and analyzing data to draw conclusions or inferences about the phenomena represented by the data.

Data Analysis:

Test of Reliability:

First, the research will test the reliably of each section of the survey to be sure of the results obtained. To assess the questionnaire's reliability, Cronbach's alpha was employed, and the table below presents the reliability coefficients obtained via this metric.

Table 1: AI-Based Decision Support Systems

Variables	Cronbach's Alpha	N of Items
Predictive Accuracy	0.888	5
Data Quality	0.855	5

System Integration	0.774	5
Usability & Interaction	0.819	5
Decision Support	0.846	5

From the table above, it is evident that the AI-Based Decision Support Systems dimensions exhibit high values, with reliability coefficients of 0.888, 0.855, 0.774, 0.819, and 0.846 corresponding to Predictive Accuracy, Data Quality, System Integration, Usability & Interaction, and Decision Support, respectively. Consequently, these reliability coefficients indicate the validity of the statements related to the application, as well as the reliability of the results and the level of trust.
Test of the validity:

The researcher calculates the validity of the correlation coefficient for each dimension of the questionnaire to calculate the total honesty as follows:

Table (2): Correlations to calculate the validity of the questionnaire dimensions

Variables	**Pearson correlation coefficient values**	P-value
Predictive Accuracy	0.899(**)	0.000
Data Quality	0.892(**)	0.000
System Integration	0.896(**)	0.000
Usability & Interaction	0.919(**)	0.000
Decision Support	0.926(**)	0.000

** p-value significant at (0.01)

From the above table the validity of questionnaire dimension, we find that the correlation coefficient values are statistically significant at p-value <0.01 between the dimensions and total questionnaire and Pearson correlation coefficient values were (0.899, 0.892,0.896,0.919 & 0.926) for (Predictive Accuracy , Data Quality, System Integration, Usability & Interaction , Decision Support)consequently.

Table (3): Staff Performance

Variables	Cronbach's Alpha	N of Items
Operational Efficiency	0.896	5
Compliance with Educational Standards	0.834	5
Service Quality	0.876	5
Stakeholder Interaction	0.808	5
Continuous Performance Improvement	0.817	5

From the above table illustrate that, Staff Performance The sharing dimensions exhibited high values, with reliability coefficient values of 0.896, 0.834, 0.876, 0.808, and 0.817 for Operational Efficiency, Compliance with Educational Standards, Service Quality, Stakeholder Interaction, and Continuous Performance Improvement. Consequently, these reliability coefficients indicate the validity of the statements within the application as well as the reliability of the results and the resulting trust.
Test of the validity:

The researcher assesses the validity of the correlation coefficient for each dimension of the questionnaire to compute the overall honesty as follows:

Table (4): Correlations to calculate the validity of the questionnaire dimensions

Variables	r	P-value
Operational Efficiency	0.886(**)	0.000
Compliance with Educational Standards	0.912(**)	0.000
(Service Quality	0.939(**)	0.000

Stakeholder Interaction	0.859(**)	0.000
Continuous Performance Improvement	0.889(**)	0.000

The p-value is significant at 0.01. From the table evaluating the validity of the questionnaire dimensions, it is observed that the correlation coefficient values are statistically significant at $p < 0.01$ between the dimensions and the overall questionnaire, and the Pearson correlation coefficients were. **(0.886, 0.912,0.939,0.859 & 0.889) for (Operational Efficiency, Compliance with Educational Standards, Service Quality, Stakeholder Interaction, Continuous Performance Improvement) consequently.**

Table (5): Reliability of the Statements of the Questionnaire Dimensions

Variables	Cronbach's Alpha	N of Items
AI-Based Decision Support Systems	0.958	25
Staff Performance	0.949	25
Overall Questionnaire	0.978	50

From the previous table on the reliability results of the questionnaire dimensions regarding the role of environmental information systems, it was found that the **Cronbach's Alpha coefficients were all high, exceeding 0.700**, which confirms the reliability of the questionnaire dimensions. The Alpha values were **0.958, 0.949, and 0.978** for the **independent variable (**AI-Based Decision Support Systems**), the dependent variable (**Staff Performance**), and the overall questionnaire**, respectively. The values are high, which means a high level of reliability and presence of the study objectives achievement.

Descriptive Statistics Results for the Study Variables

The measurements of the strength of the dimensions that make up the variables of the study were performed through the use of the descriptive statistics comprising of the arithmetic mean, the standard deviation, and the percentage weight. These measures have been used to rank the dimensions according to the prevalence that they are deemed by the group of the study.

A **five-point Likert Scale** was used to assign a degree to each item. A unified response format was adopted to match the phrasing of the questionnaire items. Respondents were presented with each statement and asked to choose one of five responses that reflected their level of agreement. Each response was assigned a numerical weight representing the degree of agreement with the statement.

Results of the Descriptive Analysis of the Questionnaire Items Descriptive statistics The arithmetic mean, standard deviation, and relative percentage weight were employed to determine the extent to which the questionnaire components were available from the perspective of the study sample, as follows:

Measurement of Decision Support Systems Based on Geographic Information Systems (GIS-DSS) – Independent Variable

Table (6): Results of the Descriptive Analysis of the Items of Predictive Accuracy

N	Statement	Mean	SD	Weight Percentile
1	X1	3.54	1.14	70.84
2	X2	3.45	0.97	68.92
3	X3	3.57	1.05	71.33
4	X4	3.37	1.03	67.47
5	X5	3.37	1.02	67.47
Predictive Accuracy		3.46	0.87	69.20

Results of the Descriptive Analysis of the Predictive Accuracy:

From The preceding table detailing the study sample's responses to the items within the spatial analysis dimension indicates that the overall mean for the dimension is 3.46, corresponding to a relative weight of 69.20%, which denotes the sample's agreement with this dimension. The means for the individual items fall within 3.37 to 3.57, with relative weights ranging from 67.47% to 71.33%. These scores indicate the sample size of the study has agreed with the items in regards to Predictive Accuracy.

Table (7): The Descriptive Analysis of the Items of the Data Quality.

N	Statement	Mean	SD	Weight Percentile

1	X6	3.31	0.96	66.27
2	X7	3.71	1.11	74.22
3	X8	3.37	1.01	67.47
4	X9	3.42	0.91	68.43
5	X10	3.14	1.05	62.89
Data Quality		3.39	0.80	67.86

Results of the Descriptive Analysis of the Data Quality:

Based on the above table on the responses of the study sample regarding the Data Quality items, it was established that the overall mean of the dimension had been attained at 3.39, which has a relative weight of 67.86, showing that the sample concurred with the dimension. The individual items means were between 3.14 and 3.71 with the relative weight of 67.45 to 74.22. These numbers show that the study sample endorses the Data Quality items.

Table (8): Results of the Descriptive Analysis of the Items of the System Integration

n	Statement	Mean	SD	Weight Percentile
1	X11	3.10	1.24	61.93
2	X12	2.95	1.07	59.04
3	X13	3.69	0.99	73.73
4	X14	3.33	1.20	66.51
5	X15	3.24	1.12	64.82
System Integration		3.26	0.82	65.20

Results of the Descriptive Analysis of the System Integration

Based on the table above where the responses of the study sample to the questions included in the information systems integration dimension have been organized, it was ascertained that the average of the dimension was 3.26 with relative weight of 65.20 showing agreement among the study sample on the dimension. The specific item means were 2.95 to 3.33 with relative weights of 59.04 to 73.73 indicating the concurrence of the study sample with the items that referred to System Integration.

Table (9): Results of the Descriptive Analysis of the Items of the **(Usability & Interaction**

N	Statement	Mean	SD	Weight Percentile
1	X16	3.33	1.01	66.51
2	X17	3.24	1.14	64.82
3	X18	3.27	1.34	65.30
4	X9	3.57	0.97	71.33
5	X20	3.54	1.11	70.84
(Usability & Interaction		3.39	0.85	67.76

Results of the Descriptive Analysis of the (Usability & Interaction From the previous table describing the responses of the **Usability & Interaction**, it was found that the **overall mean of The dimension rose to 3.39, carrying a relative weight of 67.76%, a clear signal of how strongly the sample agreed on this dimension. And then, the means of the.** individual items ranged between **3.24 and 3.57**, with relative weights between **64.82% and 71.33%**. These values reflect the agreement of the study sample on the items of the **(Usability & Interaction**.

Table (10): Results of the Descriptive Analysis of the Items of the **(Decision Support**

N	Statement	Mean	SD	Weight Percentile
1	X21	3.36	0.99	67.23
2	X22	3.42	1.22	68.43
3	X23	3.24	0.97	64.82
4	X24	3.36	1.08	67.23
5	X25	3.31	1.22	66.27

(Decision Support	3.34	0.87	66.80

Results of the Descriptive Analysis of the (Decision Support From the previous table describing The study's sample responses to the items within the Decision Support dimension revealed an overall mean of 3.34, corresponding to a relative weight of 66.80%, which signifies the sample's agreement with this dimension. The means of the individual items were. items ranged between **3.24 and 3.36**, with relative weights between **64.82% and 67.23%**. These values reflect the agreement of the study sample on the items of the **Decision Support**

Table (11): Results of the Descriptive Analysis of the Items of the **Operational Efficiency**

N	Statement	Mean	SD	Weight Percentile
1	Y1	3.17	1.01	63.37
2	Y2	3.37	1.10	67.47
3	Y3	3.35	1.08	66.99
4	Y4	3.41	1.10	68.19
5	Y5	3.52	1.12	70.36
Operational Efficiency		3.36	0.91	67.28

Results of the Descriptive Analysis of the Operational Efficiency From The preceding table summarizing the study sample's responses to the items on Operational Efficiency revealed that the dimension's overall mean was 3.36, corresponding to a relative weight of 67.28%, indicating respondent agreement with this dimension. The means of the individual items ranged between **3.17 and 3.52**, with relative weights between **63.37% and 70..36%**. These values reflect the agreement of the study sample on the items of the **Operational Efficiency**.

Table (12): Results of the Descriptive Analysis of the Items of the **Compliance with Educational Standards**

N	Statement	Mean	SD	Weight Percentile
1	Y6	3.66	0.98	73.25
2	Y7	3.37	0.91	67.47
3	Y8	3.02	1.06	60.48
4	Y9	3.04	1.14	60.72
5	Y10	3.30	1.00	66.02
Compliance with Educational Standards		3.28	0.79	65.59

Results of the Descriptive Analysis of the Compliance with Educational Standards From The preceding table summarizing the study sample's responses to the items assessing Compliance with Educational Standards indicates an overall mean of 3.28 for this dimension, corresponding to a relative weight of 65.59% and reflecting agreement within the sample. The average of the separate items had the values of 3.02 to 3.66 and the relative weights of 60.48% to 73.25%. Such values show how the sample concurred with items related to Compliance with Educational Standards.

Table (13): The outcomes of the Descriptive Analysis of the Items of the Service Quality.

N	Statement	Mean	SD	Weight Percentile
1	Y11	3.10	1.13	61.93
2	Y12	3.20	1.15	64.10
3	Y13	3.16	0.99	63.13
4	Y14	3.13	1.00	62.65
5	Y15	3.04	1.09	60.72
Service Quality		3.13	0.88	62.51

Results of the Descriptive Analysis of the Service Quality From the preceding table detailing the study sample's responses to the Service Quality items, the overall mean for the dimension was 3.13, corresponding to a relative weight of 62.51%, indicating respondent agreement with this dimension. The means of

individual items were between 3.04 and 3.20 (the relative weights were between 60.72 and 64.10). These values are indicative of the agreement of the study sample to the items of the Service Quality.

Table (14): Findings from the descriptive analysis of the items **Stakeholder Interaction**

N	Statement	Mean	SD	Weight Percentile
1	Y16	3.16	1.11	63.13
2	Y17	3.05	0.97	60.96
3	Y18	3.48	1.06	69.64
4	Y19	3.43	0.99	68.67
5	Y20	3.52	0.92	70.36
Stakeholder Interaction		3.33	0.76	66.55

Results of the Descriptive Analysis of Stakeholder Interaction From the previous table describing the responses of the study sample to the items of the **Stakeholder Interaction**, it was found that the **overall mean of the dimension reached 3.33 with a relative weight of 55.55%**, which indicates the agreement of the sample on this dimension. The means of the individual items ranged between **3.05 and 3.52**, with relative weights between **60.960% and 70.36%**. These values reflect the agreement of the study sample on the items of the **Stakeholder Interaction**.

Table (15): Results of the Descriptive Analysis of the Items of the **Continuous Performance Improvement**

N	Statement	Mean	SD	Weight Percentile
1	Y21	3.34	0.93	66.75
2	Y22	3.23	0.94	64.58
3	Y23	3.14	1.09	62.89
4	Y24	3.73	1.06	74.70
5	Y25	3.46	1.09	69.16
Continuous Performance Improvement		3.38	0.78	67.61

Results of the Descriptive Analysis of the Continuous Performance Improvement From The preceding table detailing the study sample's responses to the items of the Continuous Performance Improvement indicates an overall mean for the dimension of 3.38, corresponding to a relative weight of 67.61%, thereby signaling the sample's agreement with this dimension. The mean of individual items is between 3.14 and 3.73 with a relative weight of between 62.89% and 74.70%. These findings indicate that the study sample concurs with the items that relate to Continuous Performance Improvement.

Table (16): Simple Linear Regression Analysis of the use of AI-based decision support systems and improvement of the performance of teachers in Iraqi schools.

Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R^2)	F-value	t-value	Sig. (p-value)
AI-based decision support systems	the improvement of teachers' performance in Iraqi schools	0.906	0.939	0.875	569.15	23.86	>0.001

The table above shows the results of the simple regression analysis of the study on the impact of using AI-based decision support systems on improving teacher performance in Iraqi schools. This model resulted in the correlation coefficient (R) of 0.939 which is statistically significant at the level of 0.01. As a result, there is a correlation between the implementation of AI-based decision support systems and the improvement of the performance of teachers in Iraqi schools.

The table also shows that the coefficient of determination (R^2) was 0.875, indicating a prediction that the use of AI-based decision support systems will improve teacher performance in Iraqi schools by 87.5%. The rest 21.5 percent is credited to other reasons.

An F- value of 569.15 was used to test the significance of the regression model and it is less than 0.001, which shows that it is statistically significant. Also, B test results show that an increase in one unit of the use of AI-based decision support systems would lead to a 0.906 increase in teacher performance at Iraqi schools. Findings of Simple Regression Analysis: The simple regression analysis results on the effects of implementing artificial intelligence-based decision support systems on enhancing the performance of teachers in Iraqi schools showed the following:

The model exhibited a correlation coefficient (R) of 0.939, which is statistically significant at the 0.01 level, indicating a strong positive relationship between the variables. use of AI-based decision support systems and the enhancement of teachers' performance.

- The coefficient of determination (R^2) was **0.875**, suggesting that approximately **87.5%** of the variance in teachers' performance can be explained by the use of AI-based decision support systems, while the remaining **12.5%** is attributable to other factors.
- The regression model's significance was established by the F-test, yielding $F = 569.15$ with $p < 0.001$, thereby confirming the model's validity.

The regression coefficient (B) was also used to further reveal that a one-unit increase in the use of AI-based decision support systems results in an increase in the performance of teachers in the Iraqi schools by 0.906 units.

Charts

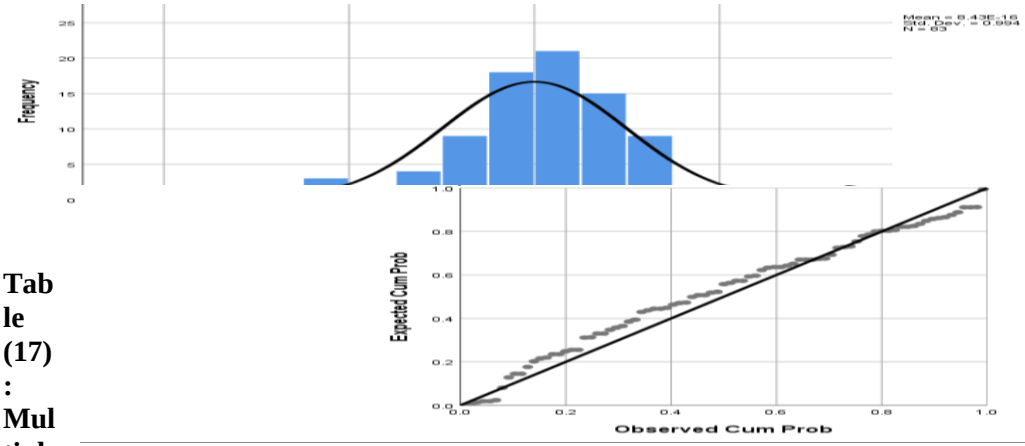


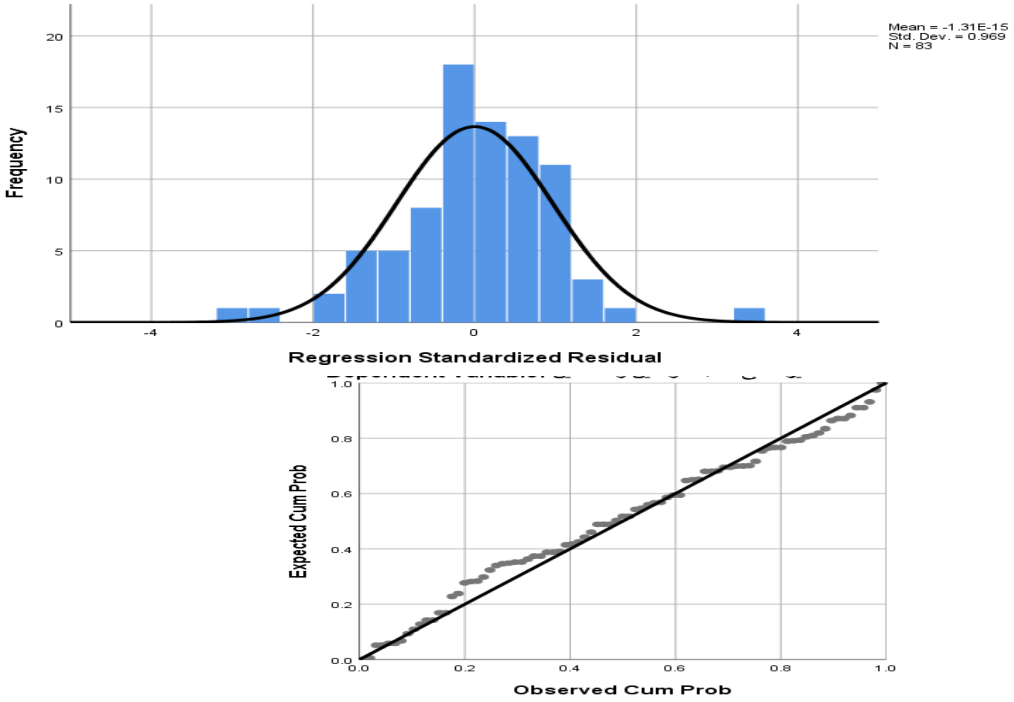
Table (17): Multiple Linear Regression Analysis of relationship between the use of AI-based decision support systems and the improvement of teachers' performance in Iraqi schools

Independent Variables (Dimensions)	Regression Coefficient (B)	t-value	Sig. (p-value)	Correlation Coefficient (R)	Coefficient of Determination (R^2)	F-value	Sig. (p-value)
Constant	.296	2.448	.017	.950a	.902	142.159	0.001
Predictive Accuracy)	.017	.289	.773				
Data Quality)	.142	2.161	.034				
System Integration)	.077	1.250	.215				
Usability & Interaction)	.359	4.926	.000				
Decision Support)	.297	4.238	.000				

Interpretation of the Multiple Linear Regression Analysis (H1)

The multiple regression analysis of the relationship between the use of AI-based decision support systems and the improvement of teachers' performance in Iraqi schools the following:

- The **correlation coefficient (R = 0.950)** indicates a strong and statistically significant relationship at a significance level less than 0.01 between the There is a statistically significant relationship between the use of AI-based decision support systems and the improvement of teachers' performance in Iraqi schools.
- The **coefficient of determination (R^2 = 0.902)** shows that 90.2% of the variance in equity distribution can be explained by the independent variables (Predictive Accuracy , Data Quality, System Integration, Usability & Interaction , Decision Support). The remaining 10.8% is attributed to factors outside the model.
- The F-statistic (F = 142.159) is statistically significant at $p < 0.01$, confirming the validity of the regression model.
- The regression coefficients (B) for each dimension indicate the direction and magnitude of their contribution. Positive values of B demonstrate that increasing the use of these relationship between the use of AI-based decision support systems and the improvement of teachers' performance in Iraqi schools.
- **Charts**



Testing the Validity of the Second Hypothesis Use of artificial intelligence tools in the administration of schools results in a rise in the efficiency of the administrative planning in relation to the traditional method.

In testing this hypothesis, a simple linear regression was used to determine the effectiveness of artificial intelligence tools in school administration in relation to the effectiveness of administrative planning compared to the conventional methods.

Table (18): Simple Linear regression Analysis of The use of artificial intelligence tools in school administration results in increasing efficiency of administrative planning in comparison to the traditional form of planning.

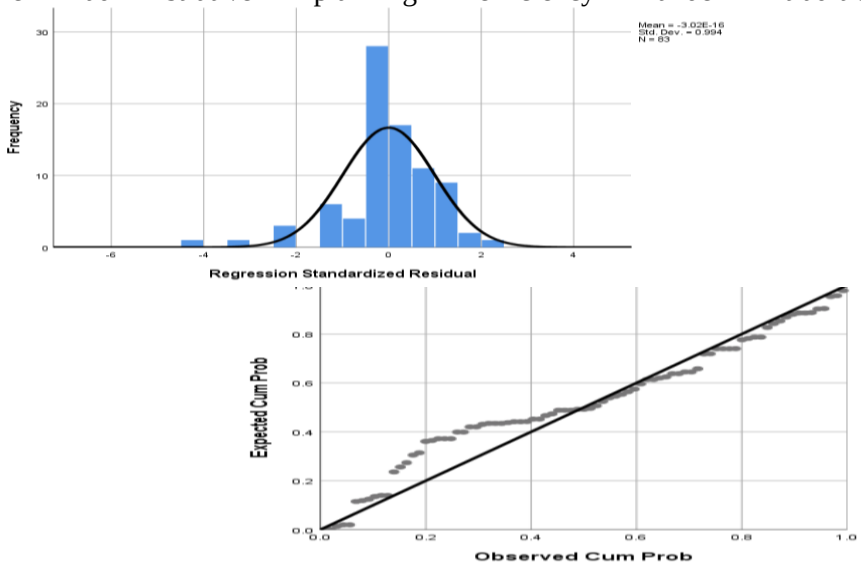
Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R^2)	F-value	t-value	Sig. (p-value)

The application of artificial intelligence tools in school	leads to an increase in the efficiency of administrative planning compared to traditional methods	0.740	0.806	0.694	149.832	12.241	0.001

Interpretation of the Simple Linear Regression Analysis (H2)

Results of Simple Regression Analysis

- The results of the simple regression analysis that was used to test the effect of implementing the tools of artificial intelligence in the school administration on the efficiency of the administrative planning as opposed to the traditional approach resulted in the following results:
- The correlation coefficient (R) was found to be 0.806 with the statistically significant level of 0.01 which means that there is a strong positive correlation between the use of AI tools in school administration and the advancement of administrative planning efficiency.
- The coefficient of determination (R 2) was 0.694, which means that approximately 69.4 percent of the variance of the administrative planning efficiency could be represented by the use of AI tools, and the rest of the 30.6 percent could be explained by other variables.
- The validity of the regression model was determined through the F-test which gave a value of 149.832 which has a p value of less than 0.001 hence the statistical significance of the regression model.
- Also, the regression coefficient (B) showed that with an increase in one unit in the use of AI tools in school administration, the administrative planning efficiency would improve by 0.740 units relative to the administrative planning efficiency under traditional methods. **Charts**



- Third Hypothesis: Intelligent analytics usage helps to enhance the quality of administrative decisions based on valid information.

Table (19): Simple Linear Regression Analysis of The use of intelligent analytics contributes to the enhancement of the quality of administrative decisions made on the basis of the correct data.

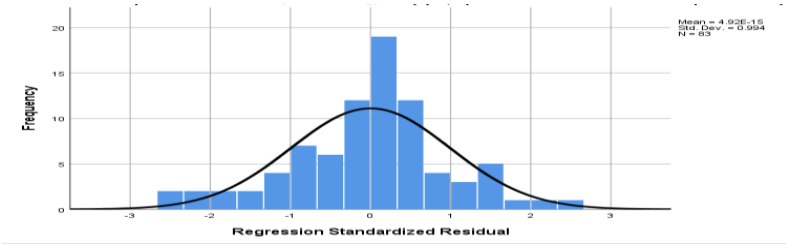
Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R^2)	F-value	t-value	Sig. (p-value)
use of intelligent analytics contributes	improving the quality of administrative decisions based on accurate data	0.720	0.755	0.570	107.377	10.362	0.001

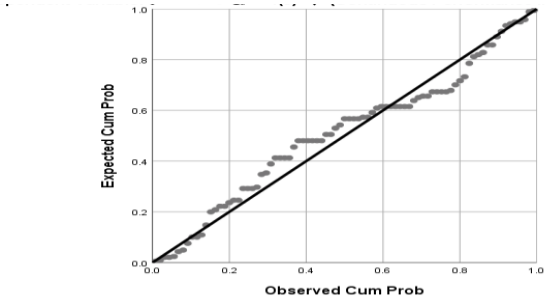
Interpretation of the Simple Linear Regression Analysis (H3)

Results of Simple Regression Analysis

- The regression analysis that explored the impact of intelligent analytics on improving the quality of administrative decisions based on the accurate data has produced the following results:
- Correlation coefficient (R): The correlation coefficient was 0.755 which is statistically significant at the level of 0.01 and this means that there is a strong positive relationship between the use of intelligent analytics and improvement of the quality of decisions.
- The coefficient of determination (R 2) was 0.570 which indicated that the quality of administrative decisions can be explained by the presence of intelligent analytics by approximately 57.0 percent and the other 43.0 percent can be explained by other factors.
- To get the statistical significance of regression model, F-test was done with a value of 107.377 with a p-value of $p < 0.001$, which proved the validity of the regression model.
- The regression coefficient (B) further demonstrated that an increase of one unit in the use of intelligent analytics leads to an improvement of **0.720 units** in the quality of administrative decisions based on accurate data.

Charts





Fourth Hypothesis: The acceptance of artificial intelligence technologies by educational staff is positively associated with the effectiveness of implementing decision support systems in enhancing institutional performance.

Testing the Validity of the Fourth Hypothesis The acceptance of artificial intelligence technologies by educational staff is positively associated with the effectiveness of implementing decision support systems in enhancing institutional performance

To test this hypothesis, a **simple linear regression analysis** was conducted to examine the impact of information systems integration (independent variable) on reducing geographic gaps in educational distribution (dependent variable).

Table (20): Simple Linear Regression Analysis of the Effect of Information Systems Integration on Reducing Geographic Gaps in Educational Distribution

Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R^2)	F-value	t-value	Sig. (p-value)
The acceptance of artificial intelligence technologies by educational staff	positively associated with the effectiveness of implementing decision support systems in enhancing institutional performance	0.683	0.801	0.642	145.243	12.052	0.001

Interpretation of the Simple Linear Regression Analysis (H4)

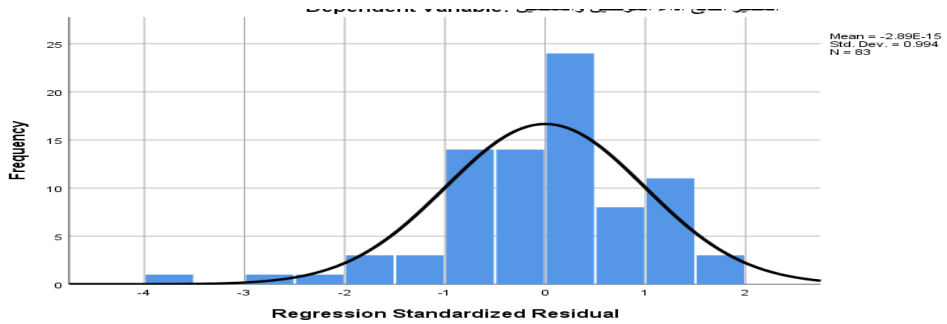
The regression analysis of the effect of information systems integration on reducing geographic gaps in educational distribution revealed the following:

Results of Simple Regression Analysis

- The results of the regression analysis results that were conducted to determine how acceptance of artificial intelligence technologies by educational staff influences the effectiveness of the implementation of decision support systems to improve the performance of institutions have shown the following results:
- The correlation coefficient (R) was 0.801, which is statistically significant at the level of 0.01, which shows that there is a strong positive correlation between the acceptance of AI technologies by the staff and the improvement of the performance of the institution.
- Coefficient of determination (R2) was 0.642 which implied that the staff acceptance of AI technologies will explain about 64.2 percent of the variation in institutional performance with the rest of the 35.8 percent being due to other factors.

The validity of the regression model was determined using F-test that gave a value of 145.243 with p value under 0.001 thus indicating statistical significance of the model.

Charts



7-Results

1- The reliability tests along with the validity tests indicated a high level of reliability of the study instrument, the Cronbach's alpha value of all the tests being greater than 0.70. Overall, the consistency of the questionnaire was 0.978 which proves the consistency of the results of the study.
2- The descriptive analysis showed that AI-based decision support systems implementation in the Iraqi schools was moderate to high with a mean score of between 3.26 and 3.46 which showed good availability of the systems.
3- The outcome of the linear regression shows that there is a significant positive effect of AI-based decision support systems on teacher performance which is statistically significant as indicated by the correlation coefficient of 0.939 and coefficient of determination 0.875 meaning that AI has a significant role to play in the improvement of performance.
4- Simple linear regression analysis revealed a strong positive correlation between AI-based decision support systems and teacher performance ($R = 0.939$, $p < 0.01$), with an R^2 value of 0.875. This suggests that AI system usage accounts for 87.5% of the variance in teacher performance scores, indicating a substantial association.
5-The results confirmed a significant positive impact of applying artificial intelligence tools on improving the efficiency of administrative planning, with an impact rate of 69.4%, demonstrating the importance of these systems in developing administrative processes.
6-The results also showed that using intelligent analytics significantly contributes to improving the quality of administrative decisions, with an impact rate of 57%, thus enhancing the accuracy and effectiveness of decisions.
7-Furthermore, the results indicated that employee acceptance of artificial intelligence technologies has a significant positive impact on improving institutional performance, with an impact rate of 64.2%, underscoring the importance of the human element in the successful implementation of these technologies.
8-Recommendations:
1-Promote the use of AI-based decision support systems in educational institutions due to their effective role in improving performance.
2-Develop the technological infrastructure in schools to support the implementation of AI systems.
3-Provide training programs for educational and administrative staff to enhance their skills in using AI systems. Improving the quality of data used in decision support systems to ensure accurate results.
4-Encouraging educational administrations to use intelligent analytics in planning and decision-making.
5-Promoting a culture of digital transformation and acceptance of artificial intelligence among employees.
6-Supporting the implementation of intelligent decision support systems to achieve greater efficiency in resource allocation and improved institutional performance.

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