

The Role of Digital Learning in Improving Job Performance of Employees A Field Study at ADES Company

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Summary: This study aims to identify the role of digital learning in improving job performance among employees at ADES Company, a multinational petroleum services provider operating in Algeria. The research employed a descriptive analytical approach, incorporating a case study design and a questionnaire as the primary data collection tool. The sample consisted of 73 employees from the company's oilfield workshops. The collected data were analyzed using SPSS software. The findings reveal that an increase in digital learning positively contributes to job performance improvement at ADES Company.

Keywords: Digital learning, job performance, performance improvement, training, development.

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I-Introduction:

The world experiences continuous advancements in information and digital communication technology, with computers and digital software becoming integral across all age groups. As a result, the development of education has become an inevitable necessity. Institutions are now competing to integrate modern digital teaching technologies, methods, and techniques into their training curricula. These advancements in information delivery and presentation methods not only motivate employees but also significantly improve their performance. Digital learning serves as a powerful tool to address the current knowledge explosion, providing diverse approaches to education, training, and development. Digital technologies and software have become indispensable in modern educational and professional contexts. This study aims to explore the extent to which this relatively new form of learning contributes to improving job performance among employees within the organization.

1.1. Problem Statement

In light of the above, the following research problem statement can be formulated:

To what extent does digital learning play a role in improving job performance among employees at ADES Company?

1.2. Study Hypotheses

Main Hypothesis: Digital learning contributes to improving job performance for employees at ADES Company.

Sub-Hypotheses:

1. There is a statistically significant correlation between technological infrastructure and the level of job performance among employees at ADES Company.
2. There is a statistically significant correlation between organizational and managerial practices and the level of job performance among employees at ADES Company.
3. There is a statistically significant correlation between digital learning strategies and the level of job performance among employees at ADES Company.
4. There is a statistically significant correlation between the continuity of digital learning skill development programs for employees and their level of job performance at ADES Company.
5. There is a statistically significant correlation between the level of employee participation in digital educational programs and activities and their level of job performance at ADES Company.

1.3. Study Objectives:

This study aims to explore the role of digital learning in enhancing job performance within the organization by examining the extent to which the dimensions of digital learning influence employees' performance improvement. ADES Company was selected as a model for this study due to its adoption of digital learning systems within the institution over a considerable period.

1.4. Study Importance:

The significance of this study lies in its effort to identify the role of digital learning in improving employee job performance within the organization, as well as fostering the culture of digital learning among employees and exploring its future prospects. Digital learning contributes to fulfilling qualitative standards and enhancing organizational quality by offering flexible learning opportunities anytime and anywhere, addressing learners' needs, promoting critical thinking, enriching the learning and training process, and supporting employees in becoming more self-reliant through self-learning opportunities. Moreover, it helps reduce the costs associated with employee learning and training.

1.5. Research Methodology and Variables:

The study used a descriptive-analytical approach to investigate the relationship between the independent variable, digital learning and its dimensions, and the dependent variable, job performance. A questionnaire served as the primary data collection tool, employing a three-point Likert scale to measure the study variables. The collected data were analyzed utilizing SPSS statistical software.

II. Literature Review:

A study by Emmanuel Selase Asamoah and Michael Avenorgbo (2021), entitled "**The Impact of E-Learning on Employee Performance in Small and Medium-Sized Enterprises During the COVID-19 Pandemic**", aimed to evaluate the impacts of e-learning on employee performance in small and medium-sized enterprises (SMEs) during the COVID-19 pandemic. The article discusses how SMEs adapted their training and development functions in response to the pandemic.

The study establishes a scientific foundation for understanding the relationship between e-learning and employee performance, serving as a basis for experimental research in the field of e-training and development. A quantitative approach was employed to fulfill the study's objectives. Data collection involved a survey targeting employees from various SMEs. Both descriptive and inferential analyses were performed, with data analyzed based on frequencies, and correlation and regression analyses conducted to explore the nature of the relationship between e-learning and employee performance.

The findings revealed a significant correlation between the infrastructure of e-learning, e-learning methods, and employees' performance. Furthermore, the study highlighted several challenges employees faced with e-learning, including a lack of awareness, bandwidth and connectivity limitations, computer illiteracy, and insufficient high-quality e-learning content. These challenges require substantial investment, not only during the development and implementation phases but also for ongoing maintenance.

The study concluded that SMEs that improve employees' performance through effective training are better positioned to remain competitive in the market.

A study by Khloud Bou Kamal, Mohamed Al Aghbari, and Mohamed Atteia (2016), entitled "**E-Training and Employee Performance: A Practical Study on the Ministry of Education in the Kingdom of Bahrain**", published in the Journal of Resources Development and Management, aimed to examine the effect of e-training on employee performance at the Ministry of Education in the Kingdom of Bahrain. The study used a descriptive-analytical approach and distributed a questionnaire to a sample of 194 employees at the ministry. After statistically analyzing the responses, the results demonstrated a significant positive relationship between the dimensions of e-training, including material requirements, training process efficiency, and training methods, and employee performance. The study also found a positive and significant relationship between the main independent variable, e-training, and employee performance, with a correlation coefficient of 0.358.

Based on these findings, the study recommended that the ministry adopt an e-training strategy, providing employees with flexibility to acquire diverse knowledge for various positions.

A study by Dr. Ammad Zafar and Dr. Noureen Aleem from SMI University (2023), entitled *Digital Media Training Programs and Their Role in Enhancing Employee Skills and Performance*, aimed to investigate how digital media training programs affect employee performance and skills in the media sector in Karachi, Pakistan. The study addresses a significant information gap by assessing the effect of such training initiatives on employees' abilities and performance. The study sought to determine whether digital media training programs have a statistically significant and substantial impact on improving employees' skills and performance in Pakistan's media sector. A mixed-

methods research approach was used, incorporating both quantitative surveys and qualitative interviews. A sample of 120 employees working in the media industry participated in the study, offering valuable insights into their experiences with digital media training. The findings of this study indicated that participants who underwent virtual media education demonstrated skills 17 times more advanced and higher performance compared to their non-participating counterparts, with an Exp (B) value of 17.250. This confirms the significant statistical effect on the transformative potential of these digital learning programs. The analysis and results of this study provide practical advice for media groups and policymakers, emphasizing the significance of strategic investments in comprehensive and continually updated digital media education initiatives.

III. Theoretical Framework of the Study

1. Digital Learning Concept

The Arab Organization for Administrative Development defines digital learning as: "A method of teaching and learning utilizing electronic media in the process of transferring and delivering information between the teacher and the learner, such as computers, networks, media like audio and video, electronic libraries, the internet, and others. The use may be as simple as employing these electronic media to present and discuss information within classrooms, or it may extend to what is called virtual classrooms, where the educational process takes place through network technologies, video, and others." (Najwa & Atoui, 2020, p. 4).

Digital learning is "a modern learning service that relies on the use of technological innovations from network infrastructure, the internet, cloud computing, and smart devices, alongside training the learner on ways to access, use, and benefit from information, by creating an environment that stimulates the development of creativity, innovation, social participation, intellectual culture, and effective communication among the components of the educational process." (Najwa & Atoui, 2020, p. 5).

Digital learning is defined as: "A technique utilized in education, where a set of integrated programs forms a system for managing the required knowledge content to be learned or trained on. It offers tools for controlling the learning process, managing educational resources by gathering, classifying, and indexing them, and managing instructional design and development processes." (Ahmed, Mohammed, & Al-Ghareeb, 2018, p. 155).

It is also defined as a set of integrated interactive services and a comprehensive system that enables secure training and learning through the internet. It provides beneficiaries of the educational process with the opportunity to offer sufficient data, information, and tools that support and improve the method of delivering and managing educational services employing a simple user interface. (Amina, 2022, p. 82).

2. Digital Learning Dimensions:

Technological Infrastructure: This encompasses everything needed to create and operate software applications within an organization. It involves hardware, network components, operating systems, data storage, and the various software programs utilized by the organization to offer IT services and operate internal software solutions.

Organization and Management: This refers to the management plans, strategies, and processes employed to direct and organize the digital learning program and schedule.

Digital Learning Strategies: A dynamic and evolving combination of educational and technological methods sought at stimulating effective

e and comprehensive learning in a digital context, such as virtual reality and machine learning.

Continuity of Digital Learning Skills Development Programs for Employees: This pertains to the ongoing and continuous updating of digital and interactive training programs within the organization.

Level of Employee Participation in Digital Educational Programs and Events: This reflects the degree of response and participation of employees in this relatively new form of learning, as well as their level of interest and engagement.

3. Job Performance Concept

Job performance is defined as: "The individual's completion of various tasks that constitute his job by exerting a specific type of effort, enabling the transformation of inputs into outputs with defined specifications and at the lowest possible cost. This occurs within a work environment that supports the accurate execution of these efforts in the shortest time and at the lowest cost. Job performance results from the interaction of three main determinants: motivation, work environment, and ability. It represents a purposeful behavior sought at accomplishing tasks precisely, efficiently, and cost-effectively." (Khawla, 2019-2020, p. 37).

It can also be defined as: "A set of management behaviors that express the employee's performance of his tasks and the taking of responsibility. This includes performance quality, proper execution, the required technical expertise for the job, as well as communication and interaction with other members of the organization, adherence to administrative aspects of the job, and seeking to respond to them with care and effectiveness." (Musaad, 2012, p. 33).

Based on the previous definitions, job performance can be defined as: "A set of management behaviors through which the individual in the organization aims to transform inputs into outputs with defined specifications and at the lowest possible cost, as a result of the interaction of three main determinants: motivation, work environment, and ability, to deliver more effective and efficient job performance in the organization."

3. Methodological Procedures for the Field Study

3.1. Study Population and Sample:

The study population consists of all employees at the ADES Company in 2024. The sample included a random selection of 73 employees.

3.2. Questionnaire Design:

The study questionnaire was designed to include a set of questions reflecting the theoretical aspects of the topic for the sample of employees at the ADES Company, as well as insights from previous studies. The final questionnaire consisted of 28 items divided into two sections as follows:

First Section: This section contains demographic data related to the study participants, including gender, age, education level, job level, and years of experience.

Second Section: This section includes the study variables, which were further divided into two axes as follows:

- **First Axis:** Focuses on the independent variable of the study, which is digital learning. It includes 20 items divided into the following dimensions:
 - **First Dimension:** Represents technological infrastructure, covering items 1 to 4.
 - **Second Dimension:** Represents organization and management, covering items 5 to 8.
 - **Third Dimension:** Represents digital learning strategies, covering items 9 to 12.
 - **Fourth Dimension:** Represents the continuity of digital learning skills development programs for employees, covering items 13 to 16.
 - **Fifth Dimension:** Represents the level of employee participation in digital educational programs and activities, covering items 17 to 20.
- **Second Axis:** Focuses on the dependent variable of the study, which is job performance, and includes 8 items.

The "three-point Likert scale" was employed to measure the study variables, assigning weights to the response values for the ordinal variables, with the SPSS version 25 statistical software utilized for analysis.

Table 1: Three-Point Likert Scale

Mean of Agreement Levels	General Trend of the Sample
(1.66 - 1)	Disagree
(2.34 – 1.67)	Neutral
(3 -2.34)	Agree

Source: Prepared by the researcher based on previous studies

4. Statistical Analysis Results

4.1. Reliability and Internal Consistency of the Study Tool

4.2. Study Tool Reliability:

The reliability of the questionnaire refers to the ability of the test to consistently produce the same findings when administered multiple times to the same group. Several statistical formulas and methods exist to calculate the reliability of a questionnaire. In our study, the reliability of the questionnaire items was verified employing Cronbach’s Alpha coefficient method.

Table 2: Cronbach’s Alpha Coefficient for the Study Tool

Questionnaire Axes	Cronbach's Alpha Coefficient
Digital Learning	0.903
Job Performance	0.896
Overall Questionnaire	0.851

Source: Prepared by the researcher based on the outputs of SPSS V25

We find that the Cronbach's Alpha coefficient value for all sections of the questionnaire exceeds the minimum threshold of 0.6, with a total value of 0.851 for all questionnaire items. This indicates the reliability of the study tool, demonstrating validity and consistency within the sections, as well as a correlation among the questionnaire items. Thus, the study’s findings can be generalized.

4.3. Internal Consistency Validity of the Questionnaire:

This is one of the validity measures of the study tool, assessing the extent to which the questionnaire fulfills its intended goals. It aims to evaluate the correlation between the total score of each dimension and the total score of the section it belongs to. Furthermore, it examines the correlation between the total score of each section and the overall score of the entire questionnaire. Statistically, validity is represented by the Pearson correlation coefficient. The following tables present the findings of calculating the internal consistency validity for the sections and dimensions of the questionnaire as follows:

Table (3): Illustrates the internal consistency validity of the study tool

Questionnaire Axes and Dimensions		Correlation with the Overall Questionnaire Score		
		Correlation Coefficient	Significance Level	Result
Study Dimensions and Axes	First Dimension: Technological Infrastructure	**0.903	0.000	Significant
	Second Dimension: Organization and Management	**0.854	0.000	Significant
	Third Dimension: Digital Learning Strategies	**0.843	0.000	Significant
	Fourth Dimension: Continuity of Digital Learning Skill Development Programs for Employees	**0.878	0.000	Significant
	Fifth Dimension: Employee Participation in Digital Educational Programs and Events	**0.944	0.000	Significant
	First Axis: Digital Learning	**0.809	0.000	Significant
	Second Axis: Job Performance	0.955	0.000	Significant
Significant: there is a statistically significant correlation between the item and the total score of its axis				

Source: Prepared by the researcher based on SPSS.V25 outputs.

The table above demonstrates that the Pearson correlation coefficients for each dimension of the first axis and the total score of all items within the first axis ranged between 0.843 and 0.944. These are statistically significant values, as the Sig (significance level) for each correlation coefficient is

less than 0.05. This indicates that the dimensions of the first axis are valid and consistent with their intended measurements. Additionally, the correlation coefficients between each axis of the questionnaire and the total score of the entire questionnaire ranged between 0.809 and 0.955. These values are also statistically significant, as the Sig (significance level) for each correlation coefficient is less than 0.05. Thus, the axes of the questionnaire are valid and consistent with the objectives they were designed to measure.

5. Hypothesis Testing

5.1. Testing the First Hypothesis:

To test this hypothesis, we will use simple regression analysis. The hypothesis will be formulated statistically as follows:

Hypothesis: There is a statistically significant correlation between technological infrastructure and the level of employees' performance at ADES Company.

Table No. (4): Simple Linear Regression for the Hypothesis

Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Calculated F Value	Significance Level (Sig)
Technological Infrastructure	Job Performance	0.459	0.383	0.146	12.185	0.000

Source: Prepared by the researcher based on SPSS.V25 outputs.

The table above indicates that technological infrastructure contributes to improving job performance, as demonstrated by the correlation coefficient value of ($R = 0.383$), which is statistically significant at a level lower than 0.05. The coefficient of determination ($R^2 = 0.146$) indicates that technological infrastructure accounts for 14.6% of the improvement in job performance. The calculated Fisher value was 12.185, with a significance level of 0.000, which is statistically significant.

Based on this, there is a statistically significant impact between the studied variables. Thus, we accept the hypothesis that there is a statistically significant correlation between technological infrastructure and the level of job performance of employees at ADES Company.

5.2. Testing the Second Hypothesis:

To test this hypothesis, we will use simple regression analysis. The hypothesis is formulated statistically as follows:

Hypothesis: There is a statistically significant correlation between organization and management and the level of job performance of employees at ADES Company.

Table No. (5): Simple Linear Regression for the Hypothesis.

Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Calculated F Value	Significance Level (Sig)
Organization and Management	Job Performance	0.018	0.025	0.01	0.045	Not significant

Source: Prepared by the researcher based on SPSS.V25 outputs.

The table above demonstrates that organization and management do not contribute to improving job performance, as shown by the correlation coefficient value of ($R = 0.025$), which is not statistically significant. The coefficient of determination ($R^2 = 0.01$) indicates that organization and management do not contribute to improving job performance. The calculated Fisher value of 0.045 is also not statistically significant.

Based on this, there is no statistically significant impact between the studied variables. Therefore, we reject the hypothesis that there is a statistically significant correlation between organization and management and the level of job performance of employees at ADES Company.

5.3. Testing the Third Hypothesis:

To test this hypothesis, we will utilize simple regression analysis. The hypothesis is formulated statistically as follows:

Hypothesis: There is a statistically significant correlation between digital learning strategies and the level of job performance of employees at ADES Company.

Table No. (6): Simple Linear Regression for the Hypothesis.

Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Calculated F Value	Significance Level (Sig)
Digital Learning Strategies	Job Performance	0.501	0.381	0.145	12.072	0.000

Source: Prepared by the researcher based on SPSS.V25 outputs.

The table above indicates that digital learning strategies contribute to improving job performance, as demonstrated by the correlation coefficient value of ($R = 0.381$), which is statistically significant ($p < 0.05$). The coefficient of determination ($R^2 = 0.145$) shows that digital learning strategies account for 14.5% of the improvement in job performance. The calculated Fisher value is 12.072, with a significance level of 0.000, which is statistically significant.

Based on this, there is a statistically significant effect between the studied variables. Thus, we accept the hypothesis that there is a statistically significant correlation between digital learning strategies and the level of job performance of employees at ADES Company.

5.4. Testing the Fourth Hypothesis:

To test this hypothesis, we will employ simple regression analysis. The hypothesis is formulated statistically as follows:

Hypothesis: The continuity of digital learning skill development programs for employees contributes to improving job performance at ADES Company.

Table No. (7): Simple Linear Regression for the Hypothesis

Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R^2)	Calculated F Value	Significance Level (Sig)
Sustainability of digital learning skills development programs	Job Performance	0.207	0.328	0.108	8.585	0.005

Source: Prepared by the researcher based on SPSS.V25 outputs.

The data from the table above demonstrate that the continuity of digital learning skill development programs for employees contributes to improving job performance, as evidenced by the correlation coefficient value of ($R = 0.328$), which is statistically significant ($p < 0.05$). The coefficient of determination ($R^2 = 0.108$) indicates that the continuity of digital learning skill development programs accounts for 10.8% of the improvement in job performance. The calculated Fisher value is 8.585, with a significance level of 0.005, which is statistically significant.

Based on this, there is a statistically significant effect between the studied variables. Therefore, we accept the hypothesis that there is a statistically significant correlation between the continuity of digital learning skill development programs for employees and the level of job performance at ADES Company.

5.5. Testing the Fifth Hypothesis:

To test this hypothesis, we will utilize simple regression analysis. The hypothesis is formulated statistically as follows:

Hypothesis: There is a statistically significant correlation between the level of employees' participation in digital educational programs and activities and the improvement of job performance at ADES Company.

Table No. (8): Simple Linear Regression for the Hypothesis

Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Calculated F Value	Significance Level (Sig)
Employees' participation in digital educational programs and events	Job Performance	0.162	0.323	0.104	8.279	0.005

Source: Prepared by the researcher based on SPSS.V25 outputs

The data from the table above show that employees' participation in digital educational programs and activities contributes to improving job performance, as evidenced by the correlation coefficient value of ($R = 0.323$), which is statistically significant ($p < 0.05$). The coefficient of determination ($R^2 = 0.104$) indicates that employee participation in digital programs and activities contributes 10.4% to improving job performance. The calculated Fisher value is 8.279 at a significance level of 0.005, which is statistically significant.

Based on this, there is a statistically significant impact between the studied variables. Hence, we accept the hypothesis that there is a statistically significant correlation between the level of employee participation in digital educational programs and activities and the improvement of job performance at ADES Company.

5.6. Testing the Main Hypothesis:

Hypothesis: Digital learning contributes to improving job performance for employees at ADES Company.

Table No. (9): Simple Linear Regression for the Hypothesis

Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Calculated F Value	Significance Level (Sig)
Digital education	Job Performance	0.405	0.383	0.147	12.187	0.001

Source: Prepared by the researcher based on SPSS.V25 outputs

The table above indicates that digital learning contributes to improving job performance, as demonstrated by the correlation coefficient value of ($R = 0.383$), which is statistically significant ($p < 0.05$). The coefficient of determination ($R^2 = 0.147$) shows that digital learning accounts for 14.7% of the improvement in job performance. The calculated Fisher value is 12.187, with a significance level of 0.000, which is statistically significant.

Thus, there is a statistically significant effect with a meaningful effect between the studied variables, and we accept the hypothesis that digital learning contributes to improving job performance for employees at ADES Company.

As mentioned above, four out of the five sub-hypotheses related to the dimensions of digital learning were accepted regarding their contribution to improving job performance for employees. Furthermore, the main hypothesis was accepted, demonstrating that digital learning plays a role in improving job performance for employees within the organization under study.

IV-Conclusion:

The study's results clearly demonstrate the significant contribution of digital learning, with its various dimensions, in improving and developing job performance for employees in the organization under study. The findings revealed a statistically significant effect of technological infrastructure, digital learning strategies, the continuity of digital learning skill development programs for employees, and the level of employee participation in digital educational programs and events on the dependent variable, improving job performance. However, the results also indicated that there is no statistically significant relationship between organization and management and the level of job performance for employees in the institution under study.

The results concluded that the independent variable, digital learning, contributes to improving job performance, demonstrating a direct correlation that any increase in the use and application of digital learning leads to improved job performance.

The findings of the current study align with various previous studies on this topic, particularly concerning the effect of technological infrastructure on improving job performance, such as the study by Emmanuel Selase Asamoah and Michael Avenorgbo entitled "The Impact of E-Learning on the Performance of Employees in Small and Medium Enterprises During the COVID-19 Pandemic," which discusses the effect of digital learning programs on job performance and improving organizational outcomes. This is consistent with the study by Ahmed Yahya Al-Hamoud

Al-Shamrani (2019) entitled "The Impact of Employing Digital Learning on the Quality of the Educational Process and Improving Its Outcomes."

After conducting the field study, the following findings were concluded:
- The organization under study adopts modern digital methods in the training and education process for employees, facilitating communication, enhancing collaboration in the workplace, reducing costs, and providing employees with significant opportunities to develop self-learning skills according to their needs and goals. It also enables them to enhance collective performance.

Based on our study and the results of previous research, we propose the following recommendations:

1. The institution should promote a culture of digital learning by providing continuous guidance to employees, increasing their participation, and motivating them.
2. Increasing the financial allocations to support digital learning programs by providing the necessary infrastructure and resources required to implement digital learning and training within the organization and among employees.
3. The organization should keep pace with the rapid and ongoing developments in the field of digital learning, training, and development for employees and staff.

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