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The Impact of Employing E-Learning Technologies on Improving University Teaching Performance : A Field Study at Kasdi Merbah University – Ouargla from Students' Perspective

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Abstract:

The growing interest in enhancing university teaching performance has paralleled the integration of modern technologies and diverse instructional tools in higher education. E-learning technologies have become a cornerstone of contemporary educational systems, particularly in the wake of global digital transformations. This study aims to explore the impact of employing e-learning technologies on university teaching performance from the perspective of students at Kasdi Merbah University – Ouargla.

Using a descriptive-analytical approach, a structured questionnaire was distributed to a sample of 600 students, with 497 valid responses analyzed using SPSS 25. The results indicated a generally positive perception of e-learning platforms and their role in enhancing teaching effectiveness. Furthermore, the study found statistically significant correlations between the use of e-learning technologies and various dimensions of teaching performance, such as instructional planning, content delivery, interaction, and assessment. The findings underscore the necessity of institutional investment in digital infrastructure and training programs to maximize the pedagogical potential of e-learning tools in Algerian universities.

Keywords: e-learning technologies; university teaching performance; Moodle platform; digital education; Algerian higher education; teaching effectiveness

1. Introduction

The rapid evolution of information and communication technologies has significantly influenced educational systems worldwide, particularly in higher education institutions that strive to improve the quality and effectiveness of teaching. Teaching performance is now perceived as a multidimensional concept that goes beyond content delivery, encompassing planning, pedagogical strategies, student interaction, and continuous improvement.

In response to global challenges and the increasing demand for educational innovation, universities have begun integrating e-learning technologies to enhance instructional practices and meet the needs of digital-native learners. These technologies are no longer considered optional but rather essential tools that support academic performance and institutional development.

The implementation of e-learning platforms in Algerian universities, particularly following the COVID-19 crisis, has revealed both promising opportunities and persistent obstacles. While digital tools offer flexibility and access to learning resources, they also pose challenges related to technical infrastructure, training, and pedagogical adaptation.

This study seeks to explore the impact of e-learning technologies on teaching performance at Kasdi Merbah University – Ouargla, from the students' perspective, in order to evaluate the effectiveness of current practices and suggest improvements.

1.1 Research Problem

Despite the increasing adoption of e-learning technologies in Algerian universities, the extent to which these tools have contributed to enhancing university teaching performance remains unclear. From students' point of view, it is crucial to assess whether such technologies truly support effective teaching or merely act as complementary platforms with limited pedagogical value.

Research Question

Based on the above, the central research question is:

What is the impact of employing e-learning technologies on university teaching performance at Kasdi Merbah University – Ouargla?

This main question leads to the following sub-questions:

- What is the level of teaching performance at Kasdi Merbah University from the students' perspective?
- How are e-learning technologies currently being employed in the teaching process at the university?
- Is there a statistically significant impact of e-learning technologies on teaching performance?

1.2 Research Hypotheses

The study is based on the following hypotheses:

- H1: The level of teaching performance at Kasdi Merbah University is perceived as high by students.
- H2: E-learning technologies are extensively utilized in the teaching process at the university.
- H3: There is a statistically significant impact of e-learning technologies on university teaching performance.

1.3 Research Objectives

This study aims to:

- Examine the level of integration of e-learning technologies in higher education from the students' perspective.
- Identify the main challenges associated with the implementation of e-learning tools in university teaching.
- Investigate the impact of e-learning technologies on the teaching practices of university instructors.

1.4 Significance of the Study

Scientific Significance

The present study addresses a highly relevant topic within the field of educational development—particularly the integration of e-learning technologies in university-level instruction. This topic gains importance in light of the global technological transformation and Algeria's current efforts to modernize its higher education system. The COVID-19 pandemic further reinforced the critical role of digital platforms as a primary means of sustaining academic continuity. By shedding light on students' perceptions of the effectiveness of e-learning tools, this study contributes to the academic discourse on digital pedagogy in developing countries.

Practical Significance

On a practical level, the study provides valuable insights for higher education institutions, especially in Algeria, seeking to improve the quality of teaching. By identifying strengths and weaknesses in the current use of e-learning platforms, the study offers recommendations for enhancing teaching performance through digital tools. The findings also provide a foundation for developing institutional strategies that align with the evolving demands of the knowledge economy, digital transformation, and quality assurance in education.

1.5 Literature Review

Several studies have investigated the relationship between e-learning technologies and teaching performance in the context of higher education:

- **Nàcher et al. (2021)** conducted an experimental study evaluating the effectiveness of the GoKoan e-learning platform in improving academic performance among psychology students. Results showed that blended learning—combining traditional and digital methods—had a positive impact on learning outcomes.
- **Kaddeche et al. (2021)** examined the prospects and barriers of e-learning implementation at Kasdi Merbah University during the COVID-19 crisis. The study revealed that, while faculty members recognized the importance of digital teaching tools, challenges such as limited internet access and lack of training hindered effective application.
- **Kana & Colleague (2020)** studied the impact of the MOODLE platform on faculty performance at the University of M'sila. The findings confirmed that the platform positively influenced teaching effectiveness and academic engagement.
- **Chérif Mourad & Azouz Mounir (2018)** focused on how e-learning contributes to improving the quality of higher education in Algeria. Their research highlighted a positive attitude among faculty toward digital tools but emphasized the need for more structured training and infrastructural support.

These studies collectively suggest a growing awareness of the potential of e-learning technologies to improve teaching quality but also underline the persistent structural and pedagogical challenges that need to be addressed.

2. Theoretical Framework

2.1 University Teaching Performance

Teaching performance refers to the set of instructional activities carried out by university faculty to facilitate learning. It includes planning, delivering content, interacting with students, and assessing learning outcomes. According to Nabil Boulos (2019), performance encompasses responsibilities and duties that reflect an individual's success or failure in achieving job-related goals. It is also defined as the actual behavioral output observable during the teaching process, which directly influences learning efficiency.

Key dimensions of teaching performance include:

- **Quality of Performance**: The extent to which instructional outcomes meet established standards and demonstrate reliability.
- **Accuracy**: The degree of adherence to pedagogical principles and procedures.
- **Speed**: The ability to accomplish instructional tasks in a timely manner.
- **Work Relationships**: The quality of interpersonal collaboration among colleagues to enhance the educational process (Belaidi, 2017).

Teaching performance is not an end in itself but a means of achieving improved educational outcomes through effective planning and implementation.

2.2 The University Instructor

The university instructor is the central agent in the educational process, responsible for knowledge dissemination, student supervision, and academic research. Instructors contribute directly to institutional advancement and are considered key actors in pedagogical reform. Their performance significantly influences the quality of education delivered at the university level (Qambar, 2006).

2.3 Definition of University Teaching Performance

University teaching performance is defined as the set of pedagogical actions conducted by a faculty member during instruction—inside or outside the classroom—with the aim of enhancing student engagement and academic achievement. It involves direct interaction between instructor and students and encompasses activities such as content presentation, discussion facilitation, and feedback provision (Amayra, 2006).

For the purposes of this study, teaching performance is conceptualized as:

"All instructional practices carried out by a university faculty member that involve planning, content delivery, and interaction, ultimately aimed at fostering students' academic success."

2.4 Evaluating Teaching Performance

Evaluating teaching performance is crucial for improving instructional quality. It involves analyzing specific aspects of the educator's work to determine their current competency levels and identify areas for improvement. Evaluation serves as a basis for implementing corrective strategies and training interventions that enhance performance effectiveness (Abdelmohsen, 2003).

2.5 Concept of Performance Improvement

Performance improvement refers to the systematic use of available resources to increase productivity and efficiency in achieving institutional goals. From a human resources perspective, it involves implementing training programs and development initiatives to address deficiencies identified through performance evaluation (Mohamed Jassem, 2014).

In the teaching context, performance improvement is defined as the process of equipping instructors with new knowledge and skills to enhance instructional quality and efficiency.

2.6 Motivations for Teaching Performance Improvement

Several factors drive the need to improve teaching performance in higher education institutions:

- Rapid technological change requiring continuous pedagogical adaptation.
- Stakeholder expectations for improved instructional quality.
- Faculty members' intrinsic motivation for professional excellence.
- Rising student demands for relevant, engaging learning experiences.
- Growing competition among educational institutions.
- The need to maintain institutional reputation and competitive advantage.
- Emphasis on quality assurance and academic accreditation standards (Masghouni, 2014).

3. E-Learning in Higher Education

E-learning refers to the use of digital technologies to facilitate educational interactions between instructors, learners, and institutions. It encompasses computer-mediated instruction, online platforms, virtual classrooms, and multimedia resources that allow for synchronous and asynchronous learning experiences (Ramzi, 2005).

E-learning aims to:

- Support instructors in preparing and delivering digital content.
- Provide students with flexible access to updated learning materials.
- Compensate for shortages in academic staff through remote instruction.
- Promote lifelong learning and digital literacy.
- Enable digital management of academic processes (enrollment, evaluation, feedback, etc.).

In Algerian universities, e-learning has become increasingly significant in response to educational disruptions, such as the COVID-19 pandemic, and in efforts to modernize instructional practices.

3.1 Advantages of E-Learning in Higher Education

Compared to traditional learning methods, e-learning offers numerous advantages that enhance the educational experience in higher education institutions:

• **Flexibility of Time and Space**: E-learning overcomes geographic and temporal barriers, allowing students to access content anytime, anywhere.
• **Expanded Access to Higher Education**: It enables universities to increase enrollment beyond physical capacity limitations.
• **Adaptation to Individual Learning Needs**: Learners can progress at their own pace, utilizing preferred learning styles.
• **Enhanced Interaction**: Students can communicate with peers and instructors via email, discussion forums, and messaging tools.
• **Promotion of Self-Directed Learning**: E-learning encourages independent study and critical thinking.
• **Administrative Efficiency**: Platforms facilitate automated scheduling, grading, and feedback delivery.
• **Diverse Assessment Methods**: Online tools offer more accurate and equitable evaluation mechanisms.
• **Rich Multimedia Content**: Learning materials can be presented through video, audio, text, and animation.
• **Content Archiving**: Lectures and materials are stored and retrievable at any time.
• **Continuous Content Updates**: Digital platforms allow instructors to regularly revise and improve instructional materials (Sherman, 2004).

3.2 The Impact of E-Learning on the Professional Environment

E-learning not only influences the academic setting but also shapes the broader professional environment:

a. Performance Enhancement

Digital learning improves task performance by reducing errors and optimizing time and effort. Learners who are exposed to visual and interactive content tend to perform better and more efficiently (Luqmani, 2003).

b. Content and Goal Alignment

E-learning ensures that instructional content is aligned with learners' evolving professional needs and career goals. This alignment fosters skill acquisition and motivation toward goal achievement (Qambar, 2006).

c. Workplace Safety Awareness

Interactive training modules can raise awareness of workplace safety and accident prevention, using simulations and real-life scenarios to build proactive behavior (Rahbani, 2012).

d. Production Quality and Quantity

Effective digital training enhances employee competence, leading to higher quality output, job satisfaction, and institutional sustainability (Jaber, 2000).

4. Field Study

4.1. Methodology and Research Instruments

This study employed a **descriptive analytical approach**, relying on a structured questionnaire composed of **24 items** distributed across **two main axes**:

• The integration of e-learning technologies
• University teaching performance

A **five-point Likert scale** was used to capture student responses. The data were processed using **SPSS version 25**, and the following statistical tools were applied:

• **Cronbach's Alpha** to assess the reliability of the questionnaire
• **Arithmetic Mean** and **Standard Deviation**
• **One-Sample t-Test**
• **Simple Linear Regression**

4.2. Population and Sample

The study population consisted of university students at **Kasdi Merbah University – Ouargla**. A total of **600 questionnaires** were distributed across various faculties, and **497 valid responses** were returned and analyzed using **SPSS 25**.

4.3. Description of the Study Sample

To describe the sample, the following demographic variables were considered: gender, age, academic level, and field of study. The distribution of these variables is presented below:

Table (01): Description of the Study Sample

Variable	Category	Frequency	Percentage (%)
Gender	Male	143	35.10%
	Female	264	64.90%
Age	18–20 years	81	19.90%
	21–25 years	211	51.80%

Variable	Category	Frequency	Percentage (%)
	26–30 years	58	14.30%
	Above 30 years	57	14.00%
Academic Level	Bachelor (Licence)	160	39.30%
	Master	184	45.20%
	Doctorate	63	15.50%
Field of Study	Humanities and Social Sciences	199	48.90%
	Sciences and Technology	208	51.10%

Source: Developed by the author based on SPSS v25 outputs.

Analysis of Sample Characteristics

- The data reveal that **female respondents** represented a significantly higher proportion (64.90%) compared to male respondents (35.10%). This reflects the demographic structure of the university, where female students constitute the majority.
- In terms of **age distribution**, the dominant category was students aged **21–25 years** (51.80%), followed by those aged **18–20 years** (19.90%). Students aged **26–30 years** and **above 30** represented 14.30% and 14.00%, respectively. This pattern corresponds with typical age ranges for Master's students.
- Regarding **academic level**, **Master's students** made up the highest proportion of respondents (45.20%), followed by **Bachelor's students** (39.30%), and finally **Doctoral students** (15.50%). This aligns with the general enrollment trends at the university, where doctoral students constitute a smaller population.
- The distribution across **fields of study** shows that **students in Sciences and Technology** slightly outnumbered those in Humanities and Social Sciences, representing **51.10%** and **48.90%**, respectively. This suggests a higher responsiveness or engagement rate among students in scientific disciplines.

4.4. Questionnaire Reliability

Reliability refers to the **stability and internal consistency** of a measurement tool. To evaluate the reliability of the questionnaire items, **Cronbach's Alpha coefficient** was calculated for each axis of the instrument.

Table (02): Cronbach's Alpha Coefficients for the Student Questionnaire

Dimension No.	Questionnaire Axes	Number of Items	Cronbach's Alpha
01	E-learning Platform (Axis 2)	42	0.854
02	University Teaching Performance (Axis 3)	52	0.958
—	**Overall Questionnaire**	97	**0.953**

Source: Developed by the researcher based on SPSS v25 outputs.

The results in Table (02) indicate that the **overall Cronbach's Alpha** for the questionnaire reached **0.953**, which is considered **very high**. This value confirms the internal consistency and **strong reliability** of the measurement tool used in this study, ensuring that the instrument yields stable and dependable results.

5. Results Analysis and Discussion

This section presents the findings of the empirical study based on the statistical analysis performed using SPSS software and appropriate analytical tools. The aim is to test the validity of the research hypotheses.

First: Analysis of Axis Two – "E-Learning Platform" from Students' Perspective

This axis includes **45 items** distributed across **four key dimensions** that represent the components of the e-learning platform. The following table summarizes the statistical results:

Table (03): Analysis Results of Axis Two – E-Learning Platform

No.	Items	Mean	Std. Dev.	Rank	Interpretation
01	I have an account on the university's e-learning platform.	3.97	1.15	3	High
02	I think the e-learning platform does not support my learning.	3.15	1.30	8	Moderate
03	The university provides various electronic media to access lectures.	3.17	1.31	7	Moderate
04	I have completed a training course on how to use the Moodle platform.	2.35	1.24	12	Low

No.	Items	Mean	Std. Dev.	Rank	Interpretation
05	I prefer a dedicated university educational channel over the current e-learning system.	4.14	1.05	1	High
06	I face technical difficulties accessing the e-learning platform.	3.66	1.27	4	High
07	The university has official websites for knowledge dissemination.	3.45	1.26	6	High
08	The university continuously improves the e-learning platform.	2.99	1.18	9	Moderate
09	I find it easy to understand online lectures on the platform.	2.88	1.32	10	Moderate
10	I prefer that lectures on the platform are in video format.	4.12	1.14	2	High
11	I have sufficient skills to use the e-learning platform.	3.46	1.25	5	High

Dimension 1: Moodle E-Learning Platform
Mean = 3.33, **Std. Dev. = 0.47** → Interpretation: **Moderate**

Item No.	Items	Mean	Std. Dev.	Rank	Interpretation
12	I benefit from lectures available on the e-learning platform.	3.20	1.20	7	Moderate
13	The content on the platform enhances my academic performance.	3.10	1.13	9	Moderate
14	Lectures are clear and easy to understand.	2.91	1.13	11	Moderate
15	Lecture organization on the platform respects academic level and specialization.	3.45	1.19	6	Moderate
16	Some lectures are not suited for e-learning format.	3.63	1.13	4	High
17	Some lectures are missing from the platform, causing pedagogical issues.	3.84	1.11	2	High
18	Lectures are uploaded as a single file (bulk).	3.09	1.30	10	Moderate
19	I believe e-learning is not compatible with my academic specialization.	3.15	1.24	8	Moderate
20	E-learning contributes to updating curricula for future needs.	3.53	1.23	5	High
21	E-learning allows storing and easy access to lectures.	3.83	1.14	3	High
22	I can access and download lectures whenever I want.	3.92	1.17	1	High

Dimension 2: Educational Content
Mean = 3.42, **Std. Dev. = 0.52** → Interpretation: **High**

Item No.	Items	Mean	Std. Dev.	Rank	Interpretation
23	I own a device with internet access.	4.05	1.10	1	High
24	I use other technological devices (smartphones, tablets) to access the platform.	3.99	1.04	2	High
25	The university provides all necessary tech resources for successful e-learning.	2.68	1.38	10	Moderate
26	I have skills in using multiple communication tools (Messenger, Skype, etc.).	3.98	1.12	3	High
27	I struggle with using technological tools.	2.53	1.27	11	Low
28	Using technology helped me better understand the content.	3.69	1.10	7	High
29	Technology integration helped modernize education.	3.84	1.09	6	High
30	I interact with instructors through the platform for assignments.	2.92	1.38	9	Moderate
31	I communicate with instructors via email.	3.54	1.23	8	High

Dimension 3: Technological Use
Mean = 3.55, **Std. Dev. = 0.56** → Interpretation: **High**

Item No.	Items	Mean	Std. Dev.	Rank	Interpretation
32	The platform exposed me to teaching methods from other universities.	3.47	1.26	8	High
33	E-learning fosters scientific thinking.	3.80	1.06	1	High
34	E-learning stimulates creative thinking.	3.57	1.11	7	High
35	It helped me learn foreign languages.	3.40	1.26	9	High
36	It allows learning a lot in a short time.	3.62	1.14	5	High
37	It enhanced my self-learning skills.	3.32	1.21	10	Moderate
38	It improved my digital and computer skills.	3.61	1.19	6	High
39	It helped me discover new e-learning tools.	3.76	1.06	2	High
40	It enabled me to stay updated in my field.	3.75	1.10	3	High
41	It enhanced my knowledge base.	3.71	1.05	4	High
42	I regularly participate in e-learning training sessions.	2.87	1.30	11	Moderate

Dimension 4: Self-Development
Mean = 3.47, **Std. Dev. = 0.69** → Interpretation: **High**
Overall Mean for the Independent Variable – E-learning Platform:
Mean = 3.46, **Std. Dev. = 0.46** → Interpretation: **High**
Source: Developed by the student based on SPSS v25 outputs. (*Significant at α = 0.05)
Discussion of Findings – E-learning Platform Axis
The overall mean of **3.46** indicates that students demonstrate a **high level of awareness** regarding the importance of the e-learning platform in the educational process.
• **Dimension 1: Moodle Platform** – Received a **moderate mean of 3.33**. Students remained neutral on many items, with the highest-rated item being a preference for a dedicated educational channel over the current Moodle platform. The **lowest score** related to lack of training on using Moodle (Mean = 2.35), revealing a **technical training gap**. Students also expressed a preference for **video-based lectures**.
• **Dimension 2: Educational Content** – Achieved a **high mean of 3.42**. Students showed a good ability to access, download, and benefit from content. However, **pedagogical challenges** remain due to the **absence of some lectures** on the platform, often attributed to **faculty neglect or mismatch with the students' fields**.
✅ Despite some limitations, the results reflect students' **moderate to high digital competence**, allowing them to benefit from e-learning content and tools in enhancing their academic learning.
Dimension 3: Technology Integration
The mean score for the technology integration dimension was **3.55** with a **standard deviation of 0.56**, indicating a **high level of agreement** among students with the items included in this dimension.
• The highest mean score was for the item:

"I own a device with internet access"
→ **Mean = 4.05**, **SD = 1.10**
• The second-highest was:
"I use various technological devices (smart boards, smartphones, etc.) to access the e-learning platform"
→ **Mean = 3.99**, **SD = 1.04**
• The lowest mean was observed for:
"I struggle to use technological tools"
→ **Mean = 2.53**, **SD = 1.27**
🟢 **Interpretation**:
The analysis of student responses indicates that the overall mean scores were **consistently high**, reflecting that students **own various internet-enabled technological devices** that allow them to access the e-learning platform efficiently.
Students also demonstrated **proficiency in internet research**, and a **strong preference for using modern technological tools** over traditional methods in conducting and presenting their academic work.
However, the findings also highlight a **notable institutional shortcoming**: the university administration **does not sufficiently provide the necessary technological infrastructure** to support effective e-learning. Despite this, students

display **a high level of motivation** to utilize available technology to **accomplish tasks and achieve their educational goals**.

Dimension 4: Self-Development

The overall mean score for this dimension was **3.47** with a **standard deviation of 0.69**, suggesting a **moderate to high level** of student agreement with the statements.

• The highest-rated item was:
"I believe that e-learning helps develop my scientific thinking."
→ **Mean = 3.80**, **SD = 1.06**

• The lowest-rated item was:
"I regularly participate in training sessions on e-learning."
→ **Mean = 2.87**, **SD = 1.30**

🟢 **Interpretation**:
This dimension reflects students' **positive attitudes** toward the role of e-learning in **stimulating creativity**, **enhancing critical thinking**, and **promoting self-directed learning**.

Despite the **limited access to formal training sessions** on using e-learning platforms and tools, students showed a desire to incorporate e-learning into their academic life. They recognize its potential for intellectual growth and skill development, including the use of electronic media and digital platforms that aid learning.

However, the lack of training **remains a barrier** to fully unleashing students' autonomous learning capacities and digital competence.

General Summary of E-learning Platform Axis

Upon analyzing the responses across all four dimensions of the e-learning platform axis, it is evident that **students maintain an overall positive perception** of the e-learning system at the university.

This is corroborated by the relatively **high mean scores** observed for most dimensions, reflecting agreement on the system's effectiveness in enhancing academic engagement and performance—despite noted shortcomings in infrastructure, training, and pedagogical content availability.

Second: Analysis of Axis Three – "Students' Comprehension of Online Lectures"

This axis includes **five dimensions** that represent the key components of **university teaching performance** from students' perspectives. These are:

1. Teaching Planning
2. Preparing Students for E-learning
3. Delivering Online Lectures
4. Electronic Interaction and Communication
5. Student Evaluation

The results are presented in the following table and analyzed accordingly.

🔍 **General Statistical Results – Axis Three**

• **Overall Mean**: **3.12**
• **Standard Deviation**: **0.69**
• **Interpretation**: Moderate Level

This indicates that, **overall**, students perceive the university's teaching performance through e-learning as **moderate**, which could be attributed to several underlying factors discussed below.

Dimension 1: Teaching Planning

• **Mean = 3.18**, **Std. Dev. = 0.81**
• Interpretation: **Moderate**

Among the items in this dimension:

• The highest-rated item was:
"Professors focus on the essential scientific content listed on the e-learning platform and only deviate when necessary"
→ **Mean = 3.43**, indicating **high agreement**.

• The lowest-rated items were:
"Professors manage online lectures smoothly" and
"Professors convince me of the importance of the course on the e-learning platform"
→ Both with a **mean of 2.99**, reflecting a **moderate to low** level of satisfaction.

🔎 **Analysis**: The results suggest that professors generally lack sufficient training in planning and preparing online lectures. This leads to less effective structuring, limited use of clear objectives, and underdeveloped support materials.

Dimension 2: Preparing Students for E-learning

• **Mean = 3.03**, **Std. Dev. = 0.91**
• Interpretation: **Moderate**

• Highest-rated item:
"Professors always link theoretical content to practical application via the e-learning platform"
→ **Mean = 3.60**, suggesting **positive engagement**.
• Lowest-rated item:
"The university organizes training and orientation sessions on how to use the e-learning platform"
→ **Mean = 2.68**, indicating **a lack of institutional support**.
🧠 **Insight**: Students feel that more needs to be done in terms of preparing them and creating an engaging online learning environment. Faculty members are not consistently setting clear expectations or making the content appealing.
Dimension 3: Delivering Online Lectures
• **Mean = 3.51**, **Std. Dev. = 0.67**
• Interpretation: **Moderate to High**
• Top-rated item:
"The e-learning platform has made it easier to download and review lectures"
→ **Mean = 3.68**
• Lowest-rated item:
"Professors present and analyze the scientific material effectively through the platform"
→ **Mean = 2.91**
🔍 **Commentary**: While students appreciate the **technical accessibility** provided by the platform, they remain **unsatisfied** with the professors' ability to deliver content in a pedagogically engaging and clear manner.
Dimension 4: Electronic Interaction and Communication
• **Mean = 3.14**, **Std. Dev. = 0.77**
• Interpretation: **Moderate**
• Most agreed-upon item:
"I believe e-learning reduces interaction between the professor and students"
→ **Mean = 3.53**
• Lowest-rated item:
"Professors develop their lectures based on students' feedback via digital platforms"
→ **Mean = 2.90**
📉 **Observation**: Students expressed concern over the **lack of two-way communication** and **limited interactive support** from professors. Most faculty members focus on content delivery rather than on fostering dialogue or collaborative exchange.
Dimension 5: Student Evaluation
• **Mean = 3.08**, **Std. Dev. = 0.76**
• Interpretation: **Moderate**
• Highest-rated item:
"Professors vary their assessment tools between traditional and electronic methods"
→ **Mean = 3.28**
• Lowest-rated item:
"Online tests were comprehensive and varied"
→ **Mean = 2.94**
📊 **Evaluation**: Students believe that the assessment process lacks diversity and modern approaches. There is a preference for more innovative evaluation methods and better alignment of assessments with course objectives. Professors often rely on traditional formats and fail to update their assessment strategies.
✅ **Overall Summary of Axis Three**
• **General Mean = 3.12**, indicating a **moderate level** of teaching performance through e-learning as perceived by students.
• The relatively modest ratings across all five dimensions reflect a **gap between the technological infrastructure and pedagogical effectiveness**.
• Students acknowledged **some technical benefits**, such as ease of access and review, but criticized the **lack of interaction, weak instructional strategies**, and **traditional assessment methods**.
• The results highlight the need for **professional development for faculty**, especially in **e-learning pedagogy**, **engagement strategies**, and **digital assessment tools**.

6. Interpretation and Discussion of Findings

This section presents an interpretation of the empirical findings based on hypothesis testing, which served as preliminary answers to the study's sub-questions. The validation or rejection of these hypotheses is grounded in statistical evidence and analysis of the actual data collected by the researcher.

6.1. Hypothesis 1:

"The level of teaching performance at Kasdi Merbah University – Ouargla is high from the students' perspective."

To test this hypothesis, we propose:

- **Null Hypothesis (H_0):** The teaching performance level is not high from the students' perspective.
- **Alternative Hypothesis (H_1):** The teaching performance level is high from the students' perspective.

Table (4): One-Sample T-Test for Hypothesis 1

Sample	N	T	Sig.	α	Test Mean	Mean	Std. Dev.
Students	407	3.510	0.000	0.05	3.00	3.12	0.69

Source: SPSS v25 Output

✅ **Interpretation**:

Since the significance value (Sig = 0.000) is less than α = 0.05, we **reject H_0** and **accept H_1**. This confirms that the perceived level of teaching performance is statistically significant and **rated as high** by students under the use of e-learning technologies.

6.2. Hypothesis 2:

"The level of e-learning implementation at Kasdi Merbah University – Ouargla is acceptable from the students' perspective."

Proposed hypotheses:

- **H_0:** The level of e-learning implementation is not acceptable.
- **H_1:** The level of e-learning implementation is acceptable.

Table (5): One-Sample T-Test for Hypothesis 2

Sample	N	T	Sig.	α	Test Mean	Mean	Std. Dev.
Students	407	20.180	0.000	0.05	3.00	3.46	0.46

Source: SPSS v25 Output

✅ **Interpretation**:

The significance value (Sig = 0.000) confirms the acceptance of **H_1** and rejection of **H_0**. Students evaluate the implementation of the e-learning system as **acceptable**.

6.3. Hypothesis 3:

"There is a positive correlation between teaching performance and the implementation of the e-learning system at Kasdi Merbah University – Ouargla."

Pearson Correlation and Regression Analysis

- **H_0:** No positive correlation exists between teaching performance and e-learning implementation.
- **H_1:** A positive correlation exists between teaching performance and e-learning implementation.

The Pearson correlation coefficient **R = 0.619** indicates a **significant positive relationship**.

Regression Model Validity

A **simple linear regression model** was used:

$Y=b0+b1X1+b2X2+b3X3Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3Y=b0+b1X1+b2X2+b3X3$

Where:

- YYY = Teaching Performance
- $X1X_1X1$ = E-learning Platform
- $X2X_2X2$ = Educational Content
- $X3X_3X3$ = Self-Development

Model Significance (F-Test)

Sig = 0.000 < 0.05 → the model is **statistically significant**.

Table (6): Regression Coefficients

Predictor	B	Std. Error	Beta	T	Sig.
Constant	1.335	0.220	—	10.061	0.000

Predictor	B	Std. Error	Beta	T	Sig.
E-learning Platform	0.189	0.067	0.127	2.807	0.000
Educational Content	0.301	0.063	0.226	4.776	0.000
Self-Development	0.361	0.041	0.403	8.764	0.000

✅ **Interpretation**: All coefficients are statistically significant, confirming their effect on teaching performance.

Final Regression Equation:

$Y=1.335+0.189X1+0.301X2+0.361X3Y = 1.335 + 0.189X_1 + 0.301X_2 + 0.361X_3Y=1.335+0.189X1+0.301X2+0.361X3$

This equation implies:

- A **unit increase** in e-learning platform quality improves teaching performance by **0.189 units**.
- A **unit increase** in content quality improves performance by **0.301 units**.
- A **unit increase** in self-development improves performance by **0.361 units**, the most influential factor.

Normality and Homoscedasticity Assumptions

- **Normality of residuals** confirmed via Q-Q plot.
- **Homoscedasticity** (constant variance of residuals) confirmed by residual scatterplot.
- **No multicollinearity** detected (VIF < 2 for all variables).

Table (7): Pearson Correlation Matrix

Independent Variable	Teaching Performance (Y)	Sig.
E-learning Platform	0.398**	0.000
Educational Content	0.481**	0.000
Technology Usage	0.428**	0.000
Self-Development	0.565**	0.000

✅ All correlations are **positive and significant** at the 0.05 level.

7. Conclusion and Recommendations

Key Findings:

- Students rated both e-learning implementation and teaching performance as **moderate**.
- There is a **statistically significant positive correlation** between e-learning use and teaching performance.
- **Self-development** was the most influential factor in enhancing teaching outcomes.

Recommendations:

- Organize **training workshops** on Moodle and other e-learning platforms for both students and faculty.
- Establish **faculty-based taskforces** to support the digital transition in teaching.
- Expand **national internet coverage**, especially in rural areas.
- Learn from **international best practices** in e-learning.
- Boost **infrastructure investment** and **technical support** in universities.
- Offer **financial and institutional incentives** for faculty engagement in e-learning.
- Create **dedicated e-learning departments** at both institutional and ministerial levels.
- Promote a **paradigm shift** from traditional teaching to digital models to meet modern educational demands.

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