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Evaluating the Moodle Platform's Support for Higher Education from the Students' Viewpoint: A Field Study at the University of Constantine2

[1] Benhamlaoui Nouna
University of Costantine 2-Algeria
nouna.benhamlaoui@univ-costantine2.dz

[2] Mosbah Laila
University of Costantine 2-Algeria
laila.mosah@univ-costantine2.dz

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Abstract

This study aims to assess the **Moodle** platform effectiveness in supporting the educational process from the students' perspective at the Faculty of Economic, Commercial, and Management Sciences at Constantine 2 University. The evaluation is based on four core dimensions: usability, content quality, interactivity, and technical performance. A descriptive-analytical approach was adopted depending on questionnaire administered to a sample of students. The findings indicate that Moodle's overall effectiveness below the expected level, with weak utilization, moderate content quality and technical performance, and relatively better interactivity. The study highlights the need for technical and pedagogical improvements to enhance the quality of university e-learning.

Keywords: Moodle platform, e-learning, platform effectiveness, higher education quality.

1. Introduction

E-learning platforms are becoming an essential part of the pedagogical process as higher education undergoes an accelerated digital transformation. One of the most popular open-source learning management systems in this regard is Moodle, which provides resources for learner interaction, assessment, content delivery, and course design. However, a number of interconnected elements, most notably usability, content quality, interactivity, and technical performance, influence this platform's efficacy.

Therefore, this study aims to assess Moodle's efficacy from the Students' viewpoint of Constantine 2 University through these dimensions to pinpoint what should be improved for the platform 's educational value enhancement.

1.1. Statement of the Problem

The following could be used to formulate the study's main question:

From the viewpoint of students at the Faculty of Economic, Commercial, and Management Sciences, how effective is the Moodle platform in all of its dimensions (usability, content quality, interactivity, and technical performance), and which areas need to be improved first?

1.2. Sub-Questions

- How much does usability improve educational value and enable easy access to learning resources?

- To what extent does content quality (currency, relevance, and comprehensiveness) satisfy the successful learning needs?
- What effect do (discussions, assignments, and feedback) have on students' engagement?
- How does technical performance (speed, stability, and data security) impact learning continuity?

1.3. Research Hypotheses

Main hypothesis (H0): Students rate the Moodle platform's overall efficacy poorly (compared to the reference value of 3 on the Likert scale).

1.3.1. Sub-Hypotheses

H01: Access to the platform and efficient use are not facilitated by usability.

H02: Developing competencies and raising academic achievement are not influenced by content quality.

H03: Interactivity neither encourages meaningful engagement nor increases student participation.

H04: Excellent technical performance does not guarantee the educational process continues or minimize barriers.

1.4. Aims of the Research:

- To evaluate the Moodle platform's efficacy from the students' perspective in each of its four dimensions.
- To prioritize dimensions for improvement and identify strengths based on their relative impact.
- To develop useful pedagogical and technical strategies to improve the platform's educational experience.

1.5. Significance of the Research

Academic significance: In the context of Algerian higher education, the study adds to Arabic-language research on assessing the efficacy of open-source educational systems.

Practical significance: It gives university decision-makers a methodical framework for setting priorities for platform development, including data security, technical support, interface design, and content publication guidelines.

1.6. Research Methodology

This study adopts a descriptive–analytical approach to develop the theoretical framework and construct the dimensional model. It relies on measuring students' perceptions using a five-point Likert scale, and it assesses reliability through Cronbach's alpha.

1.7. Previous Studies

The following table presents a selection of prior studies.

Table (01): Summary of Selected Previous Studies

No	Study Title	Study Objective	Research Method	Study Sample	Main Findings
1	Obstacles to the Use of the Moodle System in Virtual Education from the Students' Perspective	Identifying the Challenges Associated with Using the Moodle Platform in Virtual Learning	The descriptive–analytical aproach	Thirty students from the Institute of Physical and Sports Activity Sciences and Technologies	The presence of technical and organizational difficulties that limit the effective use of the platform.
2	The Reality Moodle E-Learning Platform utilization and Its Impact on the Attitudes of Students at the Faculty of Economics, Biskra University	Examining the extent of platform usage and its impact on students' attitudes	The descriptive approach	Four hundred students from the Faculty of Economics at the University of Biskra	Positive attitudes toward the platform compared to traditional education, alongside weaknesses in technical support.
3	The Reality of E-Learning in Algerian Universities and Its Impact on Academic Performance (The Moodle Platform as a Model)	Analyzing the state of e-learning and its impact on students' academic performance	The exploratory approach	Two hundred male and female students from various Algerian universities	The success of e-learning depends on the availability of adequate infrastructure and continuous training for students.
4	The Quality of E-Learning Management in Palestinian Universities in Light of International Quality Standards	Assessing the Quality of E-Learning Management and Proposing a Development Strategy	The descriptive approach (mix method)	Three hundred and thirty-three faculty members from three Palestinian universities	The level of quality was relatively high, and the study recommended adopting a sustainable development strategy.

Source: Prepared by the researchers

2. Theoretical Framework

2.1.Effectiveness of the Moodle Platform

Moodle is an open-source software system designed to provide a comprehensive e-learning environment that supports course management and the organization of teaching and learning activities. The platform's development was initiated in 1999 by the Australian engineer Martin Dougiamas with the objective of facilitating the administration of educational activities and expanding access to online learning.

Today, Moodle is widely regarded as one of the most extensively used learning management systems worldwide. It is commonly reported as being adopted across more than 138 country-including Algeria-and as serving tens of thousands of educational and training institutions internationally[1].

The effectiveness of e-learning is the capacity of a digital learning environment to achieve educational objectives efficiently, through accessible delivery, meaningful interaction, the quality of learning resources, and reliable technical support. Moodle is distinguished by its flexibility and its modular structure[2], which allows the design of diverse learning experiences. However, such effectiveness depends on aligning pedagogical design with learners' characteristics and ensuring the availability of adequate technological infrastructure[3].

2.2. Moodle Effectiveness Dimensions

2.2.1. Usability

Usability refers to the simplicity of the interface, clarity of navigation, and the reduction of steps required to reach learning content and assignments, together with learnability and the minimization of user errors. User-friendly interfaces facilitate student integration into the platform, lower the technical learning burden, and thereby support motivation for sustained engagement in learning4.

2.2.2. Content Quality

Content quality reflects the currency of learning materials, their alignment with instructional objectives, their accuracy, and their coherence across different components (lectures, readings, and

[1] Itmazi, Jamil, and Ahmed Ferchichi (eds.). Proceedings of the First International Conference on Information and Communication Technologies in Education and Training (TICET 2012). Hammamet, Tunisia, 7–10 May 2012. Phillips Publishing, 2012, p. 430.

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activities). Higher-quality content supports deeper understanding, facilitates meaning-making, and enhances the transfer of learning to subsequent academic or practical contexts[5].

2.2.3. Interactivity

Interactivity is reflected in discussion forums, timely feedback, formative assessments, and collaborative work. It strengthens the sense of presence, reduces feelings of isolation, and supports learners' self-regulation throughout the learning process[6].

2.2.4. Technical Performance

Technical performance includes page-loading speed, platform stability, cross-device compatibility, and data protection. Any technical disruption increases user friction and interrupts learning continuity, which directly influences the overall evaluation of the platform[7].

3. Field Study

3.1. Population and Sample of the Study

This study targeted the students of the Faculty of Economic, Commercial, and Management Sciences at Constantine 2 University, who represent the main research population. Due to the difficulty of covering all students, a non-random sample of 300 students was selected. This sample size is sufficient to obtain statistically significant results and provides an acceptable level of representativeness that allows for generalization of the findings to a wider population.

3.2. Dimensions of the Study

3.2.1. Effectiveness of the Moodle Platform

In this study, the effectiveness of the Moodle platform refers to its ability to support the learning process from the students' perspective, considering it as an electronic learning environment that provides an interactive digital space.

The questionnaire was constructed around four main dimensions representing the Moodle's effectiveness elements:

- **Usability:** Refers to the extent to which students can easily navigate the platform and access educational resources.
- **Content Quality:** Refers to the recency, diversity, and relevance of the educational materials provided through the platform.
- **Interactivity:** Refers to the level of participation and communication between students and instructors using Moodle's interactive tools.
- **Technical Performance:** Refers to the platform's efficiency in terms of speed, stability, and data security.

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[5] Aida, S. (2023**).**Impact of e-learning orientation, Moodle usage, and learning planning on learning outcomes in on-demand lectures.Education Sciences**,** 13(10), 1005. MDPI.

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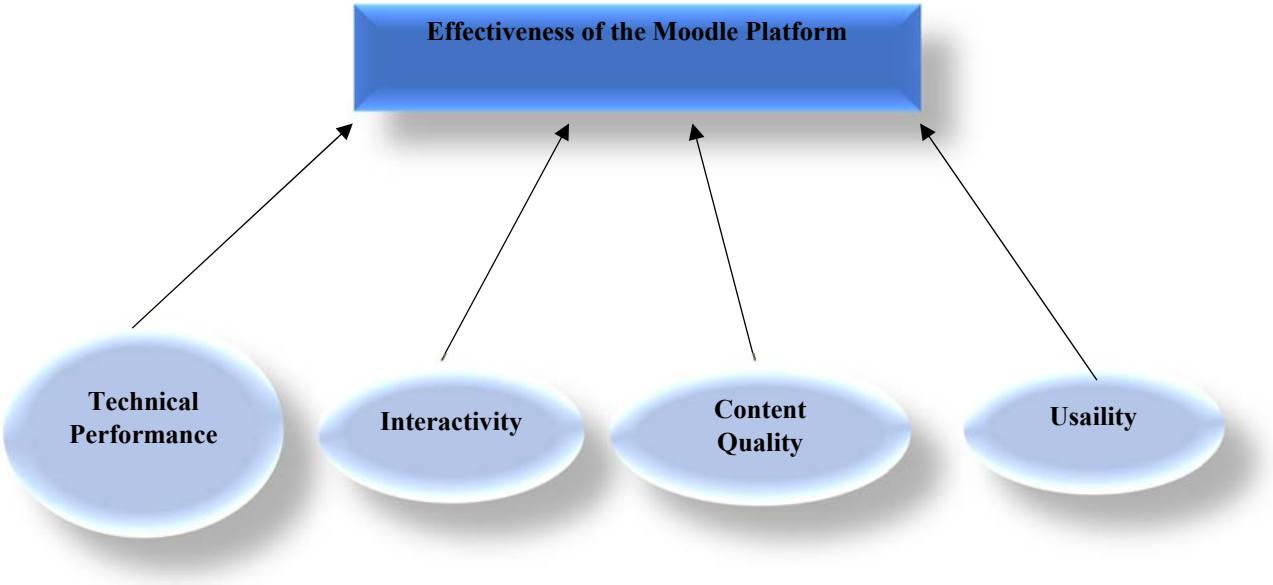
3.3. General Model of the Study

The following figure illustrates the general model of the study, where the effectiveness of the Moodle platform is determined through four main dimensions:

Figure (01): The General Model of the Study



Source: Prepared by the researchers

3.4. Methodology of the Study

The study adopted the descriptive-analytical method in order to describe and analyze the effectiveness of the Moodle platform as assessed by students, and to examine its four dimensions, thereby identifying the platform's strengths and weaknesses.

3.5.Data Collection Tool

The questionnaire was chosen as the main data collection tool due to its suitability for the nature of the study. It was designed according to a five-point Likert scale: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Strongly Agree.

The questionnaire consisted of two parts:

- **Part One:** Personal information (gender, age, academic level).
- **Part Two:** 20 items distributed equally across the four dimensions (5 items per dimension).

3.6.Classification of Responses

To determine the levels of evaluation, the following formula was used:

Class Length = (Upper Limit – Lower Limit) / Number of Categories = (5 – 1) / 5 = 0.8

Accordingly, the following intervals were adopted:

[1 – 1.8[: Very Low,[1.8 – 2.6[: Low, [2.6 – 3.4[: Moderate, [3.4 – 4.2[: High, [4.2 – 5]: Very High.

3.7. Reliability of the Study Tool

The reliability of the questionnaire refers to the stability of its results when reapplied under the same conditions. Reliability was verified using Cronbach's Alpha coefficient, which is considered acceptable if its value exceeds 0.60, the minimum threshold for judging the tool's reliability.

Table (02): Reliability of the Questionnaire

Tool of the Study	Number of Items	Alpha Value (Reliability)
Questionnaire	20	0.828

Source: Prepared by the researcher based on SPSS V26 outputs

The table shows that the Cronbach's Alpha value reached 0.828, which is well above the acceptable minimum (0.60), indicating that the study tool enjoys a high degree of reliability and is suitable for measuring the dimensions of Moodle's effectiveness.

3.8.Normality Test of the Questionnaire Data

This test aims to verify whether the questionnaire data follow a normal distribution, which allows for the use of parametric statistical tests and ensures the accuracy of the results. The following table presents the findings:

Table (03): Normality Test of the Questionnaire Data

Variable	Sig. Value
Moodle Platform	0.200
Ease of Use	0.072
Content Quality	0.200
Interactivity	0.200
Technical Performance	0.200

Source: Prepared by the researcher based on SPSS V26 outputs

The results show that all Sig. values are greater than 0.05, which indicates that the questionnaire data follow a normal distribution. Therefore, parametric tests can be reliably applied in the statistical analysis.

4. Testing hypotheses, and data analysis

4.1. Study of the Sample Characteristics

The characteristics of the sample were examined based on three main variables: gender, academic level, and frequency of using the Moodle platform.

Table (04): Characteristics of the Study Sample

Variable	Categories	Cases	Percentage (%)
Gender	Male	92	30.7%
	Female	208	69.3%
Academic Level	2nd Year	55	18.3%

	3rd Year	72	24.0%
	4th Year	65	21.7%
	5th Year	57	19.0%
	1st Year	51	17.0%
Frequency of Using Moodle Weekly	Less than once	98	32.7%
	1–3 times	127	42.3%
	4–6 times	38	12.7%
	Daily	37	12.3%

Source: Prepared by the researcher based on questionnaire results

Table (04) shows the distribution of the sample according to demographic variables, which include gender, academic level, and frequency of Moodle usage. Regarding gender, females represent 69.3% of the sample compared to 30.7% males, indicating higher female participation, which may be due to their greater responsiveness to questionnaires. Concerning the academic level, the distribution is relatively balanced, with the highest proportion in the third year (24%) followed by the fourth year (21.7%) and fifth year (19%), while the first and second years account for lower proportions (17% and 18.3% respectively). For the frequency of using Moodle weekly, most students reported using the platform 1–3 times a week (42.3%), followed by those who use it less than once a week (32.7%), whereas frequent users (4–6 times or daily) represent lower proportions (12.7% and 12.3%).

Overall, this demographic distribution provides a sufficiently diverse and representative sample in terms of gender, academic levels, and usage patterns, which enhances the credibility of the findings and allows for more accurate insights into the effectiveness of the Moodle platform in supporting the learning process.

4.2. Data Analysis on the Effectiveness of Moodle Platform

This section presents the analysis of data concerning the effectiveness of the Moodle platform in supporting the learning process. The responses of the sample are examined according to the four dimensions adopted in the questionnaire. The aim is to highlight how students perceive the platform's effectiveness across each dimension, while identifying the relative strengths and weaknesses that characterize Moodle's contribution to the educational process.

Table (05): Descriptive Analysis of Study Dimensions

Study Variable	Dimension	Mean	Std. Deviation	Level of Agreement
Effectiveness of Moodle Platform	Ease of Use	2.4427	1.17462	Weak
	Content Quality	2.7718	1.24294	Moderate
	Interactivity	3.0489	1.32871	Moderate
	Technical Performance	2.8639	1.41148	Moderate

Source: Prepared by the researcher based on questionnaire data and SPSS v26 outputs

The table shows that *Interactivity* ranked first, with a mean of 3.0489 and a standard deviation of 1.32871. This indicates that students perceived this dimension as the most prominent in supporting the learning process, even though it remained at a moderate level. In second place came Technical Performance, with a mean of 2.8639 and a standard deviation of 1.41148, suggesting an acceptable evaluation of the platform's speed, stability, and data security, while still requiring further technical improvements.

Content Quality ranked third, with a mean of 2.7718 and a standard deviation of 1.24294, which suggests that the instructional materials were perceived as moderately satisfactory but not of high quality. Finally, *Usability* came last, with a mean of 2.4427 and a standard deviation of 1.17462, highlighting notable weaknesses in navigating the platform and accessing its resources.

Overall, students' evaluation of Moodle's effectiveness ranged between weak and moderate levels, with *Interactivity* being the strongest dimension, whereas *Usability* emerged as the weakest, requiring urgent improvement to enhance the platform's effectiveness.

4.3. Hypotheses Testing

This section aims to verify statistically the research hypotheses in order to determine their significance and alignment with students' evaluation of Moodle's effectiveness.

4.3.1. Sub-Hypothesis 1 (H01)

Statement: Moodle platform Usability at the Faculty of Economic, Commercial and Management Sciences, University of Constantine 2, does not facilitate students' access to educational resources and their effective utilization, nor does it positively affect their learning experience.

Table (06): One-sample T test for the Ease of Use dimension
Test Value = 3

Dimension	T Value	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
Usability	36.019	299	0.000	2.44268	2.3092 – 2.5761

Source*:* Researcher's calculation based on SPSS v26 outputs

The results indicate a T value of 36.019 with a significance level of 0.000, which is below 0.05. This shows a statistically significant difference between the actual mean (2.44268) and the reference value (3). The 95% confidence interval (2.3092 – 2.5761) does not include the test value, confirming that the mean is significantly lower. Therefore, the null hypothesis is accepted, while the alternative hypothesis is rejected. This means that students perceive Moodle's ease of use as below the expected level.

4.3.2. Sub-Hypothesis 2 (H02)

Statement: The quality of content provided through the Moodle platform does not improve students' academic achievement or enhance their knowledge competencies.

Table (07): One-sample T test for the Content Quality dimension
Test Value = 3

Dimension	T Value	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
Content Quality	38.625	299	0.000	2.77181	2.6306 – 2.9130

Source*:* Researcher's calculation based on SPSS v26 outputs

The T value reached 38.625 at a significance level of 0.000, which is lower than 0.05, indicating significant differences between the actual mean (2.77181) and the reference value (3). The 95% confidence interval (2.6306 – 2.9130) excludes the value 3, confirming that the actual mean is lower. Accordingly, the null hypothesis is **accepted** and the alternative hypothesis rejected, meaning students evaluated content quality below the expected level.

4.3.3. Sub-Hypothesis 3 (H03)

Statement: The interactivity offered by the Moodle platform does not enhance students' participation and engagement in the learning process.

Table (08): One-sample T test for the Interactivity dimension

Test Value = 3

Dimension	T Value	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
Interactivity	39.744	299	0.000	3.04891	2.8979 – 3.1999

Source*:* Researcher's calculation based on SPSS v26 outputs

The T value of 39.744 with a significance level of 0.000 indicates significant differences between the actual mean (3.04891) and the test value (3). The 95% confidence interval (2.8979 – 3.1999) shows that the test value lies at the lower bound, very close to the observed mean, which slightly exceeds it. This supports rejecting the null hypothesis and accepting the alternative hypothesis: Moodle's interactivity does contribute positively to students' participation and engagement in the learning process.

4.3.4. Sub-Hypothesis 4 (H04)

Statement: The technical performance of the Moodle platform does not help ensure the continuity of the learning process nor reduce technical difficulties that may hinder its use.

Table (09): One-sample T test for the Technical Performance dimension

Test Value = 3

Dimension	T Value	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
Technical Performance	35.143	299	0.000	2.86389	2.7035 – 3.0243

Source*:* Researcher's calculation based on SPSS v26 outputs

The T value of 35.143 with a significance level of 0.000 confirms a significant difference between the actual mean (2.86389) and the test value (3). The 95% confidence interval (2.7035 – 3.0243) shows that the reference value lies at the upper limit, very close to the observed mean,

which is slightly lower. Thus, the null hypothesis is **accepted**, while the alternative hypothesis is rejected. This suggests that students perceive Moodle's technical performance as moderate but below the expected standard.

4.4.Main Hypothesis (H0)

Statement: The overall effectiveness of the Moodle platform, as evaluated by students of the Faculty of Economic, Commercial and Management Sciences at the University of Constantine 2, is not positive, based on its four dimensions: ease of use, content quality, interactivity, and technical performance.

Table (10): One-sample T test for Moodle effectiveness (overall variable)

Test Value = 3

Variable	T Value	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
Moodle Effectiveness	41.727	299	0.000	2.76052	2.6303 – 2.8907

Source: Prepared by the researcher based on SPSS v26 outputs

The T value of 41.727 with a significance level of 0.000 demonstrates significant differences between the actual mean (2.76052) and the test value (3). The 95% confidence interval (2.6303 – 2.8907) excludes the reference value, confirming that the actual mean is below the expected level. Therefore, the null hypothesis is **accepted**, indicating that overall, students evaluate Moodle's effectiveness as not fully positive.

5. Conclusion

The results of this study reveal that students' evaluation of Moodle's effectiveness varied across its four dimensions. *Usability* and *Content Quality* were rated below the expected level, while *Interactivity* and *Technical Performance* received moderate evaluations. This indicates that the platform does not fully achieve its intended objectives in supporting the learning process, thereby emphasizing the need for both technical and pedagogical improvements.

Key Findings

- Usability was rated significantly below expectations, reflecting difficulties students face when navigating the platform and accessing its resources.
- Content quality was also below the expected level, pointing to the necessity of regularly updating and diversifying instructional materials.
- Interactivity showed a relatively positive role in enhancing students' engagement, although its impact remains limited.
- Technical performance was moderately evaluated, with some aspects satisfactory but others-such as platform stability and file uploading-requiring improvement.
- Overall, Moodle's effectiveness was assessed as below the expected standard, suggesting it falls short of providing optimal support to the learning process.

Recommendations

- Simplify Moodle's user interface and provide clearer guidelines to address students' reported difficulties in usability.
- Improve content quality by ensuring regular updates, incorporating diverse materials (texts, videos, external resources), and aligning with current scientific developments.
- Strengthen interactivity by promoting active discussion forums, collaborative projects, and prompt instructor responses to student inquiries.
- Enhance technical performance by addressing platform slowdown and interruptions during peak times, facilitating plugin integration, and ensuring reliable file management.
- Reinforce data security measures to alleviate students' concerns about personal information protection.
- Implement periodic evaluations of student satisfaction to monitor improvements and adapt the platform to evolving educational needs.

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