

**The Impact of Moodle platform adoption on professor difficulties
under Directive Digitization Plan context
- A field study at M'Sila University-**

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Abstract:

The study investigates the impact of integrating Moodle within the Strategic Directive Plan for Digitization the university of M'Sila, focusing on its influence on teaching practices, learning outcomes, and challenges faced by professors.

A questionnaire targeting 55 professors from the faculty of economics. data analysis was conducted using PLS-SEM methodology with Smart-PLS4.

The findings revealed significant effects of Moodle adoption on professors' and students' difficulties. However, the study found no significant impact of Moodle application on infrastructure-related difficulties. Recommendations were proposed to enhance Moodle adoption and address challenges

Keywords: Moodle; directive plan of digitization; Professors' Difficulties; Students' Difficulties; Infrastructure Difficulties; M'Sila university.

Jel Classification Codes: O30 ; O32 ; O33, I2

1. INTRODUCTION

The learning process has witnessed a qualitative shift, especially after the emergence of new learning patterns that made information and communication technologies the most important foundations, and here e-learning or distance learning appeared as one of the most important results of the digital transformation, especially in higher education institutions. We find that university e-learning in particular has a greater need for information systems that contribute to the transfer of information, its sharing and the evaluation of educational contents that benefit the student. Lessons have become provided via the Internet through multiple media, making the learning environment more interactive for learning using

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information and communication technology in the fastest time and at the lowest cost, especially in a way that allows the management of the learning process, its control, its measurement and the evaluation of learners' performance through it.

The Algerian university, like other universities, relies on e-learning as an auxiliary educational model for face-to-face education, which has become inevitable to rely on for its contribution to raising the quality of its various basic functions, most notably the teaching function, despite the many challenges that the field of digitizing various university operations has known and continues to know.

The Ministry of Supervision has initiated a major "digitization master plan." This plan aims to fundamentally transform the university. It seeks to align the university with global digital advancements. A key part focuses on improving student services through e-learning.

This specifically involves using platforms like Moodle for education. The study examines the merging of the Moodle platform in universities as part of the Directive Digitization Plan (SDN) to improve teaching and learning through digital transformation. It highlights challenges such as technical, pedagogical, and infrastructural issues, focusing on professors' perspectives. Key barriers include insufficient training, limited technical support, and resistance to change. The research explores how these obstacles impact Moodle's effectiveness in meeting SDN objectives.

In this paper, we aim to explore this subject by addressing the following main question:

How does the application of the Moodle platform, within the framework of the directive plan for digitization, impact the relationship between its usage and the difficulties encountered by university professors from the University of M'Sila?

Based on the aforementioned main question, a set of sub-questions can be proposed.

- Is there a statistically significant effect at a significance level ($\alpha \leq 0.05$) of the variable "Application on the Moodle platform" on the dimension of "Professors' Difficulties," according to the professors at the Faculty of Economics, University of M'sila?
- Is there a statistically significant effect at a significance level ($\alpha \leq 0.05$) of the variable "Application on the Moodle platform" on the

dimension of "Students' Difficulties," according to the professors at the Faculty of Economics, University of M'sila?

- Is there a statistically significant effect at a significance level ($\alpha \leq 0.05$) of the variable "Application on the Moodle platform" on the dimension of "Infrastructure Difficulties," according to the professors at the Faculty of Economics, University of M'sila?

Based on the study problem and questions, the following **hypothesis** can be formulated:

- (H1): There is a statistically significant effect at a significance level ($\alpha \leq 0.05$) of the variable "Application on the Moodle platform" on the dimension of "Professors' Difficulties," according to the professors at the Faculty of Economics, University of M'sila.
- (H2): There is a statistically significant effect at a significance level ($\alpha \leq 0.05$) of the variable "Application on the Moodle platform" on the dimension of "Students' Difficulties," according to the professors at the Faculty of Economics, University of M'sila.
- (H3): There is a statistically significant effect at a significance level ($\alpha \leq 0.05$) of the variable "Application on the Moodle platform" on the dimension of "Infrastructure Difficulties," according to the professors at the Faculty of Economics, University of M'sila.

This research explores Moodle's role in advancing digital transformation as part of the Directive Digitization Plan in higher education. It examines Moodle's practical application, focusing on its potential to enhance digital learning and the challenges faced during its integration. Centered on university professors' experiences, the research provides insights into the platform's usage, barriers, and opportunities, highlighting its alignment with global digitization trends and its ability to meet the evolving needs of higher education.

- To examine how the Moodle platform has been implemented within the broader framework of the directive plan for digitization (SDN) in universities;
- To evaluate the experiences of university professors in using Moodle;
- To identify and analyze the difficulties or barriers professors face in using Moodle;
- To explore the impact of Moodle's usage on teaching and learning outcomes, as perceived by university professors;

- To suggest strategies for improving Moodle's application and overcoming challenges to optimize its benefits in higher education institutions.

The study adopted the Partial Least Squares Structural Equation Modeling (PLS-SEM) methodology using the Smart-PLS4 software. This methodology would aim to provide a comprehensive understanding of the Moodle platform's role in the university's digitization strategy, as well as the challenges and opportunities it presents from the perspective of faculty members.

Among the previous studies that addressed the topic of the master plan for digitization and the application of the Moodle platform in higher education, we mention:

The study of **ABDELAZIZ & TAHRI** (2024) explores Algeria's experience with distance education using the Moodle platform, focusing on its adoption during the coronavirus pandemic. It highlights a meaningful shift towards Moodle due to the necessity of remote education, despite challenges such as limited resources, lack of training, and technical obstacles. The findings emphasize the importance of equipping Algerian universities with adequate tools and training specialists in the platform to enhance distance education's effectiveness. The study also underscores Moodle's potential as a vital educational tool for advancing e-learning in Algerian universities.

Also the study of **ELKATEB** (2022) examines the challenges faced by English as a Foreign Language (EFL) students at Hassiba Benbouali University of Chlef in Algeria while using the Moodle platform for e-learning during the coronavirus pandemic. Through a descriptive qualitative approach and an online questionnaire, the study reveals that students struggled with technical issues, poor internet connectivity, limited interaction with teachers, and unorganized course materials. While students valued e-learning for its flexibility, they preferred a blend of traditional and online learning. The study emphasizes the need for training in ICT skills and the adoption of complementary tools like Zoom and Google Meet to enhance e-learning experiences.

The study **BELLATRACHE & ALOUTTI** (2020) explores the readiness of Algerian higher education institutions for e-learning, identifying challenges such as weak internet, lack of teacher training, and insufficient financial support. Despite some progress in ICT infrastructure and distance learning programs, significant barriers hinder full adoption. It

calls for clear policies, better resources, and strategic planning to achieve e-learning readiness.

2. Moodle: theoretical background

2.1 Definition

According to **CHOURISHI and AI (2011)** Moodle (Modular Object-Oriented Dynamic Learning Environment) is an open-source platform designed for e-learning. It serves as a Course Management System (CMS), enabling educators to develop high-quality online courses. Such platforms are also referred to as Learning Management Systems (LMS) or Virtual Learning Environments (VLE). Moodle offers robust tools for resource sharing and communication, making it a versatile educational tool. The exponential growth of online and blended learning paradigms has necessitated robust platforms for instructional delivery and management. LMS platforms like Moodle have transformed educational ecosystems, enabling asynchronous and synchronous learning tailored to diverse learner needs.

Originally Developed in 2002 by **Martin Dougiamas (2003)**, Moodle's foundation in constructivist and social constructionist pedagogies sets it apart as a tool for fostering collaboration and learner-centered instruction

2.2 Usage of Moodle by University Professors

Moodle is widely used by university professors to facilitate and enhance teaching and learning. Here's some main uses of how professors typically use Moodle.

- **Course Content Management**

Professors utilize Moodle to upload and organize lecture notes, presentation slides, videos, and other educational materials. The platform's modular structure allows for courses to be arranged into weekly or topic-based sections, facilitating straightforward navigation for students (Zaghreb, 2019)

- **Assessment and Grading**

Moodle offers robust tools for creating and managing assignments, quizzes, and exams. It supports various question formats, including multiple-choice, short answer, and essays, with automated grading options for certain types. Additionally, professors can utilize rubrics and marking guides to ensure transparent and consistent grading. (LORDAN, BIZOI, BOZOI, & HERMAN, 2021)

▪ **Blended and Flipped Learning**

Moodle supports blended and flipped classroom models by providing a platform for pre-class materials and interactive in-class activities. This approach encourages active learning and better utilization of face-to-face session time. During the coronavirus pandemic, many institutions leveraged Moodle to transition to online and hybrid teaching models, highlighting its adaptability. (Pereira & Guerreiro, 2021)

3. Directive plan of digitization: Objectives and significance

Algeria has sought to change its educational system through digitization, and despite the difficulties and problems it faced at the beginning, it continued to change the teaching method even after the health situation stabilized and the university was opened to students, as the state sought and is still seeking, through the Ministry of Higher Education, to change the education system by permanently introducing distance education, the digital library, and training university professors in the English language and other systems that contribute to the formation of an academic educational system.

The directive plan for digitization (SDN) (Ministry, 2022), which is identical to the strategic vision, aims to prepare the digital future of the higher education institution. It is therefore a project that defines and clarifies the allocation of digital supports and means necessary to manage the institution's activities and determine its location in time and space. The directive plan for digitization revolves around:

- A vision leading to strategic axes,
- Each strategic axis is divided into programs,
- Each program is in turn divided into projects that include the activities to be carried out.

4. Moodle platform and the directive plan of digitization: the relationship nature analysis

Moodle offers academics user-friendly ways to communicate, automate grading, and use multimedia. Its customization allows staff to tailor courses to specific teaching needs. However, maximizing these benefits requires technical training and ongoing support. Often, institutions don't adequately provide these necessary resources.

This highlights the need to align institutional plans with technological advancements. The directive plan for digitization in the higher education sector aims to build a special strategy to consolidate digital technology in various activities of general education and scientific

research. In this regard, this master plan includes seven main axes, which in turn branch into 16 strategic programs and 102 projects. (Ministry, 2022)

Professors encounter **several challenges** when integrating Moodle into their teaching practices. Below is an overview of these difficulties:

Table1.Main challenges

Study	Challenges
(SILBERMAN, 2021)	- Interface Complexity - Lack of Personalization - Limited Mobile Responsiveness
(GEORGIEVA, 2023)	- Inconsistent internet and inadequate devices. - Difficulties in scheduling live sessions globally. - Lack of familiarity with online platforms.
(BELLATRACHE & ALOUTTI, 2020)	-Weak internet connectivity, outdated equipment, and limited use of modern e-learning platforms like Moodle. -Lack of training for professors, weak language skills, and insufficient awareness about ICT security.
(Prokhorova, Lebedeva, Mineeva, & Tsvetkova , 2021)	-Moodle may struggle with large-scale users or content without robust infrastructure. -Reliable internet access is essential, limiting its effectiveness in areas with poor connectivity. -Customization can be difficult, requiring technical expertise, and its many features may overwhelm users.

Source: (SILBERMAN, 2021) (GEORGIEVA, 2023) (BELLATRACHE & ALOUTTI, 2020) (Prokhorova, Lebedeva, Mineeva, & Tsvetkova , 2021)

Addressing these challenges involves providing comprehensive training, ensuring robust technical support, and fostering a culture that embraces technological advancements in education.

5. Empirical study

5.1 Study population

The study population consists of all professors at the Faculty of Economics, University of M'sila. A simple random sampling technique was used to generalize the results to all professors in the Faculty of Economics at the University of M'sila. A total of 60 questionnaires were distributed, and 55 valid responses were retrieved for analysis.

5.2 Study Methodology and Model Diagnosis:

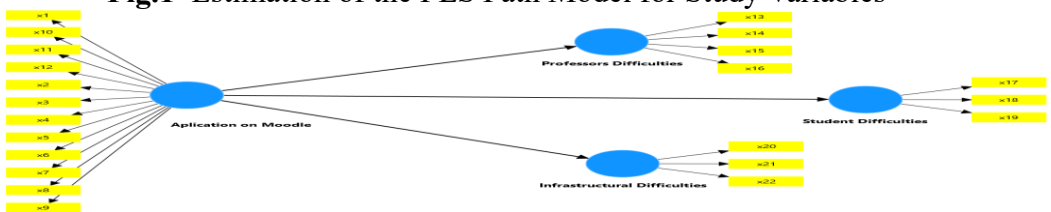
The study relied on a questionnaire as the primary data source. It was divided into two sections: First Section: Included the study variables, comprising 22 items distributed across one independent variable (the application on the Moodle platform) and three dependent variables (professors' difficulties, students' difficulties, and infrastructure difficulties).

These were measured using a five-point Likert scale (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree). Second Section: Featured an open-ended question for professors: "Provide suggestions to improve the employment of the Moodle platform to enhance the quality of teaching at the University of M'sila."

The study adopted the Partial Least Squares Structural Equation Modeling (PLS-SEM) methodology using the Smart-PLS4 software. The theoretical model consisted of several causal relationships explaining the challenges of using the Moodle platform. Four latent variables were considered with a reflective measurement model: Independent Latent Variable: Moodle platform application. Dependent Latent Variables: Professors' difficulties, students' difficulties, and infrastructure difficulties (representing dimensions of usage challenges).

The manifest variables corresponded to the items forming the four latent variables. The model was estimated using SmartPLS4, as demonstrated in accompanying diagram:

Fig.1 Estimation of the PLS Path Model for Study Variables



Source: Developed by researchers from the outputs of smartPLS4

5.3 Assessment of Reflective Measurement

5.3.1 Construct Reliability and Validity

Table shows the various tests that reflect the Construct Reliability and Validity of :Outer loadings Cronbach's alpha Composite reliability (rho_a) Composite reliability (rho_c) Average variance extracted (AVE):

Table 2. Construct Reliability and Validity

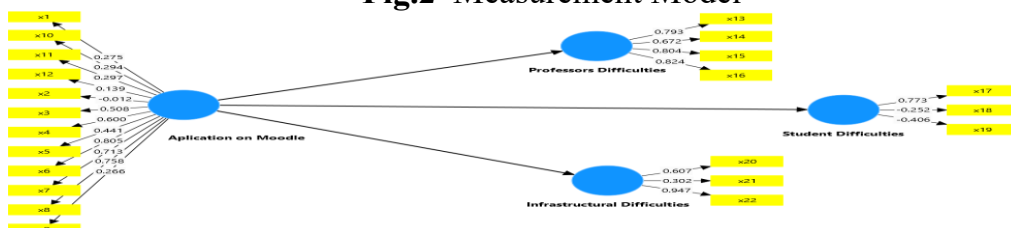
	Outer loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
x1 <- Application on Moodle	0,275	0.708	0.762	0.739	0.240
x2 <- Application on Moodle	-0,012				
x3 <- Application on Moodle	0,508				
x4 <- Application on Moodle	0,600				
x5 <- Application on Moodle	0,441				

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x6 <- Application on Moodle	0,805				
x7 <- Application on Moodle	0,713				
x8 <- Application on Moodle	0,758				
x9 <- Application on Moodle	0,266				
x10 <- Application on Moodle	0,294				
x11 <- Application on Moodle	0,297				
x12 <- Application on Moodle	0,139				
x13 <- Professors Difficulties	0,793	0.781	0.810	0.857	0.602
x14 <- Professors Difficulties	0,672				
x15 <- Professors Difficulties	0,804				
x16 <- Professors Difficulties	0,824				
x17 <- Student Difficulties	0,773	0.651	-0.559	0.006	0.275
x18 <- Student Difficulties	-0,252				
x19 <- Student Difficulties	-0,406				
x20 <- Infrastructural Difficulties	0,607	0.543	0.575	0.677	0.452
x21 <- Infrastructural Difficulties	0,302				
x22 <- Infrastructural Difficulties	0,947				

Source: Developed by researchers from the outputs of smartPLS4

Fig.2 Measurement Model



Source: Outputs of SmartPLS4

Based on the table and figure, it is evident that the loading values of the items for the variable "Application on the Moodle Platform" (AM) vary. Some loadings are superior to 0.7 (x6, x7, x8), while the rest are below 0.7. Although the Cronbach's alpha and Composite Reliability (CR) values exceed 0.7, with respective values of 0.739 and 0.708, the Average Variance Extracted (AVE) is 0.240, which is below the acceptable threshold of 0.5.

For the loadings of the dimension "Professors' Difficulties" (PD), all items have values greater than 0.7 except for item x14. Additionally, the Cronbach's alpha, CR, and AVE values are acceptable, exceeding 0.7 and 0.5, respectively, with values of 0.781, 0.857, and 0.602.

For the loadings of the dimension "Students' Difficulties" (SD), two items have loadings below 0.7 (x18, x19), while one item exceeds 0.7

(x17). The Cronbach's alpha and CR values are below 0.7, and the AVE is also below 0.5, with respective values of 0.651, 0.006, and 0.275, which are deemed unacceptable.

For the loadings of the dimension "Infrastructure Difficulties" (ID), two items have loadings below 0.7 (x20, x21), while one item exceeds 0.7 (x22). Similarly, the Cronbach's alpha and CR values are below 0.7, and the AVE is below 0.5, with respective values of 0.543, 0.677, and 0.452, which are also deemed unacceptable.

Given that there are loadings below 0.7, items with loadings below 0.4 are excluded first. The Cronbach's alpha, CR, and AVE values are then re-evaluated. Items with loadings below 0.7 are gradually removed until the AVE value increases sufficiently.

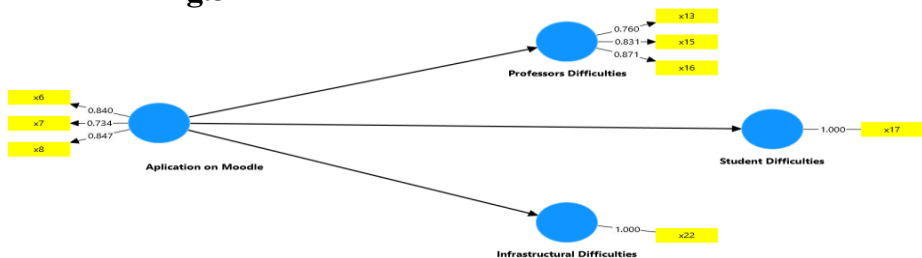
Finally, the analysis resulted in three retained items for the variable "Application on the Moodle Platform," three items for the dimension "Professors' Difficulties" (x13, x15, x16), one item for the dimension "Students' Difficulties" (x17), and one item for the dimension "Infrastructure Difficulties" (x22). The final results after item removal are presented in the following table:

Table 3. Construct Reliability and Validity after modification

	Outer loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
x6 <- Application on Moodle	0,840	0,735	0,751	0,850	0,654
x7 <- Application on Moodle	0,734				
x8 <- Application on Moodle	0,847				
x13 <- Professors Difficulties	0,760	0,768	0,827	0,862	0,676
x15 <- Professors Difficulties	0,831				
x16 <- Professors Difficulties	0,871				
x17 <- Student Difficulties	1,000	1.000	1.000	1.000	1.000
x22 <- Infrastructural Difficulties	1,000	1.000	1.000	1.000	1.000

Source: Developed by researchers from the outputs of smartPLS4

Fig.3Measurement Model after modification



Source: Outputs of SmartPLS4

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The study found strong loading values (above 0.7) for Moodle application and usage challenges (including professor, student, and infrastructure difficulties). Reliability, indicated by Cronbach's Alpha and Composite Reliability, also surpassed 0.7. Average Variance Extracted (AVE) values exceeded 0.5 for all variables and dimensions. This means each latent variable explains more than half its indicator variance. Ultimately, these results confirm the achievement of convergent validity.

5.3.2 Discriminant Validity

We test discriminant validity using three methods: Cross Loadings, Fornell-Larcker Criterion, and Heterotrait-Monotrait Ratio (HTMT) – Matrix. The following table illustrates this:

Table 4. Discriminant Validity Testing

Test Indicators	Cross Loadings				Fornell-Larcker Criterion				HTMT			
	M	D	D	D	M	D	D	D	M	D	D	D
x6 <- Aplication on Moodle	0,84	0,32	0,48	0,01	.80							
x7 <- Aplication on Moodle	0,73	0,40	0,22	0,20								
x8 <- Aplication on Moodle	0,84	0,49	0,33	0,25								
x13 <- Professors Difficulties	- 0,32	0,76	0,07	0,19	0.50	.82			.63			
x15 <- Professors Difficulties	0,34	0,83	0,09	0,27								
x16 <- Professors Difficulties	0,52	0,87	0,02	0,30								
x17 <- Student Difficulties	0,43	0,04	1,00	0,03	.43	.04	.00		.50	.09		
x22 <- Infrastructura l Difficulties	0,20	0,32	0,03	1,00	0.20	.32	0.03	.00	.23	.35	.03	

Source: Developed by researchers from the outputs of smartPLS4

The above table, related to the Cross Loadings test, shows that the item loadings for each concept (Aplication on Moodle, Professors Difficulties, Student Difficulties, Infrastructural Difficulties) were highest

within their respective concepts compared to other concepts. For instance, the loadings for the concept " Application on Moodle " (x6, x7, x8) took values of (0.84, 0.73, 0.84) respectively, which were higher compared to the other concepts (Professors Difficulties, Student Difficulties, Infrastructural Difficulties); thus, these indicators (items) are best placed within their respective concept (Application on Moodle). The same analysis applies to other concepts, confirming the discriminant validity of the measurement model through the Cross Loadings test.

The table above also demonstrates through the Fornell-Larcker criterion that all concepts represented by (Application on Moodle, Professors Difficulties, Student Difficulties, Infrastructural Difficulties) show high values with themselves, which represent the ($\sqrt{AVE}$) values. These values range from (0.80-1.000), affirming that there is no overlap between concepts, and each concept represents itself, thus achieving discriminant validity by applying the Fornell-Larcker test.

As observed from the above table and figure, all HTMT values for the study variables were within the allowable threshold; the HTMT values for the concepts were less than 85%, indicating a clear distinction between each concept and the others. This shows that the measurement model exhibits discriminant validity by applying the HTMT criterion.

5.4 Assessment of Structural Model

Having confirmed our measures are reliable and valid, we are now assessing the structural model. This involves examining causal links between variables using VIF, R^2 , F^2 , Q^2 , and GOF coefficients.

5.4.1 Collinearity statistics Problems

Table 5. Results Collinearity statistics Problems Testing (VIF, Tolerance)

	VIF		Tolerance
	Items	Indicators Aplication on Moodle <- PD, SD,ID	Indicators Aplication on Moodle <- PD, SD,ID
x6 <- Aplication on Moodle	1,667	-	-
x7 <- Aplication on Moodle	1,315		
x8 <- Aplication on Moodle	1,560		
x13 <- Professors Difficulties	1,533	1,000	1.000
x15 <- Professors Difficulties	1,786		
x16 <- Professors Difficulties	1,506		
x17 <- Student Difficulties	1,000	1.000	1.000
x22 <- Infrastructural Difficulties	1,000	1.000	1.000

Source: Developed by researchers from the outputs of smartPLS4

From the table above, it is clear that all Variance Inflation Factor (VIF) values for the independent variable are equal to 1, which does not exceed the acceptable threshold of 5. Similarly, the Tolerance values are also equal to 1, which is above the threshold of 0.2. Based on this, It can be deduced that there are no multicollinearity issues between the independent variable (application on the Moodle platform) and the various dependent dimensions (professors' difficulties, students' difficulties, and infrastructure difficulties).

5.4.2Quality criteria

5.4.2.1 R-square

Table 6. Results of the R^2 and R^2 adjusted

	R-square	R-square adjusted
Professors Difficulties	0,256	0,241
Student Difficulties	0,186	0,171
Infrastructural Difficulties	0,041	0,023

Source: Developed by researchers from the outputs of smartPLS

From the table above, it is evident that the R square coefficient for the latent endogenous variable (professors' difficulties) has a statistically acceptable value of 0.256, which falls within the range [0.19-0.33]. This indicates that the independent variable (application on the Moodle platform) explains 26% of the variance in the dependent variable (professors' difficulties), while the remaining 74% is attributed to model error or other variables.

The same applies to the other dimensions, where the explanatory power is very weak for both (students' difficulties and infrastructure difficulties), with R square values of 0.186 and 0.041, respectively. These values are below 0.19, meaning that the independent variable (application on the Moodle platform) explains only 18.6% of the variance in the dependent variable (students' difficulties) and 4% of the variance in (infrastructure difficulties).

5.4.2.2Effect of size f square

Table 7. Results Effect of size f square

	f-square	efect
Aplication on Moodle -> Infrastructural Difficulties	0,043	weak effect
Aplication on Moodle -> Professors Difficulties	0,343	moderate effect
Aplication on Moodle -> Student Difficulties	0,229	moderate effect

Source: Developed by researchers from the outputs of smartPLS4

From the table above, we conclude that the effect size on the latent endogenous variable (professors' difficulties) is weak, caused by the independent variable (application on the Moodle platform), with an effect value of 0.043, as it falls within the range [0.02–0.15].

The effect size is moderate for the latent endogenous variables (students' difficulties and infrastructure difficulties), with effect values of 0.343 and 0.229, respectively, as they fall within the range [0.15–0.35].

5.4.2.3 Predictive Relevance Q^2 (Predictive Relationship)

we calculate Q^2 using the following formula: $Q^2 = 1 - \frac{\sum_D E_D}{\sum_D E_{O_D}} = 1 - \frac{SS_E}{SS_O}$

E: Sum of squared prediction errors, O: Sum of squared errors, D: Omission distance

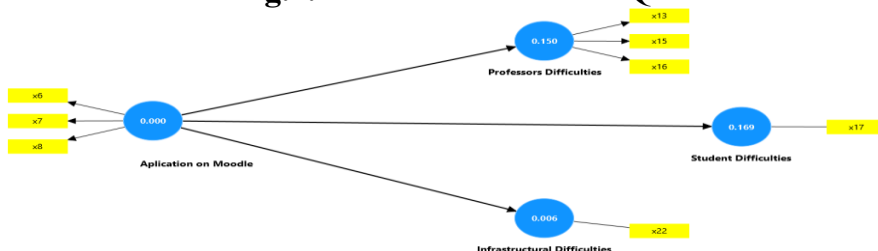
It is estimated as follows: if ($Q^2 > 0$), the model has predictive relevance. If ($Q^2 \leq 0$), the model does not have predictive relevance.

Table 8. Results of Predictive Relevance Q^2

	SSO	SSE	Q^2 (=1-SSE/SSO)
Professors Difficulties	165,000	140,275	0,150
Student Difficulties	55,000	45,729	0,169
Infrastructural Difficulties	55,000	54,671	0,006

Source: Developed by researchers from the outputs of smartPLS4

Fig.4. Predictive Relevance Q^2



Source: outputs of smartPLS4

From the table and figure above, it is shown that the Q^2 values are superior to zero for all latent endogenous variables (PD, SD, ID), with respective values of 0.15, 0.169, and 0.006. Since these values are superior to zero, it indicates that the model has predictive relevance..

5.4.3 Goodness-of-fit (GoF)

The index measures the reliability and suitability of the study model, whether it is the measurement model or the structural model. It indicates the overall quality of the model and the extent to which the experimental data fits the model. The model's Goodness-of-Fit (GOF) is calculated using the formula: $GOF = \sqrt{(AVE \times R^2)}$.

Table 9. Results of Goodness-of-fit (GoF)

	R ²	AVE	GOF	result
Professors Difficulties	0,256	0.676	0.348	moderate model
Student Difficulties	0,186	1.00		
Infrastructural Difficulties	0,041	1.00		

Source: Developed by researchers from the outputs of smartPLS4

The table above shows that the value of the Goodness-of-Fit index is 0.348, which corresponds to 34.8%. This percentage falls within the range of 25% to 36%, indicating that both the measurement model and the proposed structural model exhibit moderate quality.

5.5 Hypothesis Testing

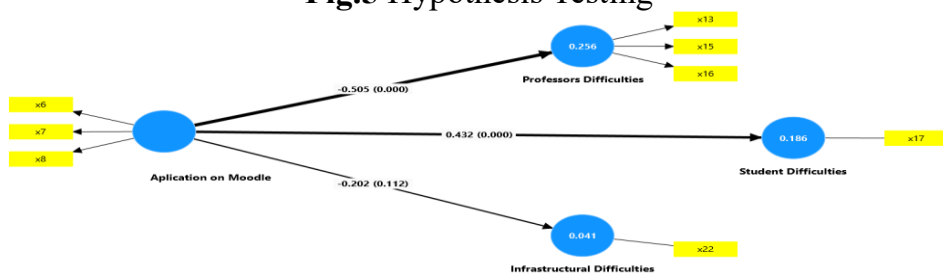
Using Smart-PLS4 and the SEM-PLS methodology, we tested the effect hypotheses for path analysis, focusing on the path coefficient (B) and the values of T-value and P-value, obtained from Smart-PLS by applying a subsample of 5000 through Bootstrapping, with a two-tailed hypothesis from the Path Coefficients window.

Table 10. Results of Hypothesis Testing

Variable	Original sample (O)	T statistics (O/STDEV)	P values	2,5%	97.5%	Result
H2 : AM -> P D	-0,505	5,447	0,000**	-0,694	-0,329	Supported
H3 : AM -> SD	0,432	4,271	0,000**	0,220	0,615	Supported
H1 : AM -> ID	-0,202	1,589	0,112	-0,446	0,048	Rejected

Source: Developed by researchers from the outputs of smartPLS4

Fig.5 Hypothesis Testing



Source: Outputs of smartPLS4

Through the table and figure above: The variable of application on Moodle platform takes negative and average direct effect factor ($B = -0.505$) and the values ($T\text{-value} = 5.447$, $P\text{-value} = 0.000$), two values that fall within permissible limits ($p \leq 0.05$, $T \geq 1.96$), with a confidence interval of $[-0.694, -0.329]$ does not include the value of zero, which indicates that there is a trace of a (application on Moodle platform) variable statistically

on the (professors difficulties) dimension from the point of view of the economics professors of the University of M'sila, and therefore refuse the zero hypothesis H_0 and accept the alternative hypothesis: **"There is a statistically significant effect at a significance level of ($\alpha \leq 0.05$) of the application variable on the Moodle platform on the professors difficulties dimension at the University of M'sila Faculty of Economics."**

Through the table and figure above: The variable of application on Moodle platform takes Positive and average direct effect factor ($B = 0.432$) and the values ($T\text{-value} = 4.271$, $P\text{-value} = 0.000$), two values that fall within permissible limits ($p \leq 0.05$, $T \geq 1.96$), with a confidence interval of $[0.220, 0.615]$ does not include the value of zero, which indicates that there is a trace of a (application on Moodle platform) variable statistically on the (Student Difficulties) dimension from the point of view of the economics professors of the University of M'sila, and therefore refuse the zero hypothesis H_0 and accept the alternative hypothesis: **"There is a statistically significant effect at a significance level of ($\alpha \leq 0.05$) of the application variable on the Moodle platform on the Student Difficulties dimension at the University of M'sila Faculty of Economics."**

Through the table and figure above: The variable of application on Moodle platform takes negative and weak direct effect factor ($B = -0.220$) and the values ($T\text{-value} = 1.589$, $P\text{-value} = 0.112$), two values that do not fall within permissible limits ($p \leq 0.05$, $T \geq 1.96$), with a confidence interval of $[-0.446, 0.048]$ that include the value of zero, M'sila University economics professors perceive no statistical effect of the Moodle application on infrastructural difficulties. Consequently, the null hypothesis H_0 is accepted: **"There is no statistically significant effect at a significance level of ($\alpha \leq 0.05$) for the application variable on the Moodle platform on the Infrastructural Difficulties dimension at the University of M'sila Faculty of Economics."**

6. CONCLUSION

Moodle's adoption at the University of M'Sila showcases its transformative educational power. The research highlights that overcoming technical and teaching hurdles is crucial for maximizing its benefits.

It offers data-backed insights and practical solutions, advancing the discourse on digital education. The directive plan for digitization guide represents a holistic structure for achieving digitization objectives in higher education, and the roadmap emphasizes continuous communication and

coordination between stakeholders to ensure its success. The directive plan for digitization ensures that all efforts to integrate digital tools in education are strategic and aligned with broader institutional goals.

Among **the results** reached after proving the first and second hypotheses and rejecting the third hypothesis, the following can be mentioned:

- One of the difficulties faced by professors at the Faculty of Economics at the University of M'sila in using the Moodle platform within the framework of the directive plan for digitization is the lack of conviction in the effectiveness of applying the platform in the educational process;
- Also, professors face real challenges in explaining lectures through the Moodle platform;
- For professors, Moodle platform is too complex to use;
- The main difficulty for student in using Moodle is due to weak computer skills;
- Finally the difficulty according to infrastructure is the frequent technical issues during Moodle platform use.

The previous results lead us to propose a set of **suggestions**, the most important of which are:

- Moodle is a widely-used learning management system (LMS), but its success heavily depends on how it is implemented and how user-friendly it is for both professors and students. Suggestions for improvement could include;
- Simplify the navigation menus to make them more intuitive.
- Professors significantly influence success of any digital learning platform. They need adequate support to maximize Moodle's
- Establish a dedicated technical support team that is easily reachable via chat, email, or phone.
- Align digitization initiatives with the institution's mission, vision, and specific academic goals.

These suggestions, when applied comprehensively, can significantly improve Moodle's efficiency, empower professors, and enhance the overall digitization strategy, leading to better academic outcomes and stakeholder satisfaction

7. Bibliography List :

- ABDELAZIZ, S., & TAHRI, H. (2024, 09). Distance Education in Algeria: The 'Moodle' Platform as a Model. *Social Sciences Journal*, 18(02), 34 - 43 .
- BELLATRACHE, R., & ALOUTTI, I. (2020, 11 30). E-Learning challenges in Higher Education Institutions-Algeria case study. *Journal of Economics and Human Development*, 11(2), 264-276.
- BENYAMIN, S. S. (2019). *Using the technology acceptance model to measure the effects of usability attributes and demographic characteristics on student use of learning management systems in Saudi higher education*. Edinburgh: Doctoral dissertation Napier University.
- Chourishi, d., BUTTAN, c., CHAURASA, a., & SONI, a. (2011, november). effective e-learning through Moodle. *international journal of advance technology and engeeniring research*, 1(1), 34-38.
- Dougiamas, M., & TAYLOR, P. (2003). Moodle: Using Learning Communities to Create an Open-Source Course Management System. *World Conference on Educational Multimedia, Hypermedia and Telecommunications (EDMEDIA)*, (pp. 171-178).
- ELKATEB, N. (2022, 07 01). Challenges Associated with E-learning on MOODLE Platform During COVID 19 Pandemic From Chlef EFL Students' Perspective. *Journal of Languages & Translation*, 120-133.
- Froissard, C., Richards , D., Amara , A., & Liu, D.-T. (2015). An enhanced learning analytics plugin for Moodle: student engagement and personalised intervention. *ASCILITE 2015*. Perth Australia.
- GEORGIEVA, M. (2023, 4 28). *Moodle for Remote and Hybrid Learning – Common Challenges and Solutions*. Retrieved 11 3, 2024, from Scalahosting: <https://www.scalahosting.com/blog/moodle-for-remote-and-hybrid-learning-common-challenges-and-solutions/>
- Hair , J., Ringle , C., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19, 139–151.
- Hair, J., Hult , G., Ringle, C., & started, M. (2017). *Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. 2nd edition.
- LORDAN, M., BIZOI, G., BOZOI, A.-C., & HERMAN, C. (2021). MOODLE PLATFORM' SUPPORT IN DIGITIZING THE ACADEMIC PROCESS. CASE STUDY WEST UNIVERSITY OF TIMIȘOARA. Italie.
- Ministry, H. e. (2022, 10 24). Vision for digitizing the higher education and scientific research sector: The Strategic Digital Plan (SDN). Algiers, Algeria.
- PAYNTER, M., & BRUCE, N. (2012). Using Moodle for Collaborative Learning with university and senior secondary students. *1st Moodle research conference*, (pp. 33-38). Heraklion, Crete-Greece.

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- Pereira, L., & Guerreiro, J. (2021). Evaluation on Moodle LMS Data Usage During the First Wave of Covid-19's Pandemic. *Universal Access in Human-Computer Interaction*. Springer
- Prokhorova, M., Lebedeva, T., Mineeva, O., & Tsvetkova, S. (2021, 03). Moodle LMS: Positive and Negative Aspects of Using Distance Education in Higher Education Institutions. *Propósitos y Representaciones*, 9(2)
- Sami, s. B. (2019). *Using the technology acceptance model to measure the effects of usability attributes and demographic characteristics on student use of learning management systems in Saudi higher education*. Edinburgh : Doctoral dissertation Napier University.
- SILBERMAN, J. (2021, 05 12). *Challenges Of Moodle UX And How To Address Them*. Retrieved 11 3, 2024, from E-learning industry: <https://elearningindustry.com/challenges-of-moodle-ux-and-how-to-address-them>
- Zagheb, u. o. (2019, 07). *Virtual Learning Environment built on Moodle becomes an integral part of teaching and learning processes in higher education in Croitia*. Retrieved 11 20, 2024, from university of Zagheb case study: https://moodle.com/wp-content/uploads/2019/07/University-of-Zagreb_Casestudy.pdf