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Students' Perceptions and Determinants of Distance Higher Education Quality: Evidence from Hassiba Benbouali University of Chlef, Algeria

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Abstract:
This study aims to examine the determinants of the student experience in distance learning (DL) at an Algerian university using a quantitative approach based on a survey of 78 students at Hassiba Benbouali University of Chlef. Data were collected through a structured questionnaire and analyzed using descriptive statistics and multiple regression analysis. The findings reveal moderate overall satisfaction (33.3% satisfied), with significant disparities according to level of study, equipment used, and connectivity quality. The study employs an integrative theoretical framework combining the Community of Inquiry model, the Technology Acceptance Model, and the success factors model proposed by Tony Bates (2019). The analysis identifies three major predictive factors of satisfaction: perceived Internet connection quality ($\beta = 0.54$, $p < .001$), prior training on platform use ($\beta = 0.31$, $p < .01$), and type of equipment used (computer vs smartphone, $\beta = 0.24$, $p < .05$). The results lead to the proposal of a hybrid DL integration model combining stakeholder training, infrastructure improvement, and adaptation of pedagogical practices.

Keywords: Distance learning, Algerian university, student experience, digital divide, pedagogical innovation.
Jel Classification Codes : I21, I23, O33, C83, O55

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1. INTRODUCTION

The digital transformation of higher education constitutes one of the major challenges facing contemporary educational systems (UNESCO, 2023). This transformation profoundly questions inherited pedagogical models, the conditions of knowledge transmission, and the role of stakeholders in the co-construction of knowledge. Distance learning (DL), long considered a marginal pedagogical modality reserved for specific audiences — adults returning to studies or geographically isolated individuals — has established itself as an unavoidable reality, particularly following the COVID-19 pandemic (Hodges, 2020).

In the Algerian context, the deployment of DL is part of a national university modernization policy whose origins date back to the early 2000s. The 2008 Framework Law on National Education, revised in 2015, laid the foundations for integrating information and communication technologies into higher education. Initiatives such as the e-Algeria 2013 program, the ARN (Algerian Research Network), and the widespread adoption of the Moodle platform in universities demonstrate an institutional willingness to integrate digital technologies (Slimani, 2019). This policy was significantly accelerated by the COVID-19 pandemic, which imposed the widespread adoption of DL within weeks under emergency conditions (Kerrouzi, 2023).

Several studies conducted in Algeria have examined the implementation of distance learning during the pandemic period. Existing research has mainly focused on the emergency transition to online teaching, technical constraints, and institutional difficulties faced by universities and teachers (Lassassi, 2020; Kerrouzi, 2023). Rachid Kerrouzi (2023), in his study conducted at the French Language Department of Hassiba Benbouali University of Chlef, highlighted the urgent mobilization of digital platforms such as Moodle, Facebook, Google Meet, Zoom, and Classroom to ensure pedagogical continuity. His findings revealed persistent challenges related to connectivity, digital skills, and access to technological resources. Similarly, Mohamed Lassassi (2020) emphasized the difficulties experienced by Algerian universities due to insufficient institutional preparation for large-scale online teaching.

However, despite the growing interest in distance learning in Algeria, several research gaps remain insufficiently explored. First, few studies have adopted an integrative analytical framework combining technical, pedagogical, human, and institutional dimensions to explain students' satisfaction with DL. Second,

existing research has largely concentrated on institutional or teacher-related challenges, while the student experience itself remains underexplored. Third, the impact of the type of digital equipment used — particularly the predominance of smartphones among Algerian students — has received limited attention in the literature, despite its potential effects on learning conditions, interaction quality, and academic engagement. Moreover, there remains a lack of empirical studies using multivariate statistical analysis to identify and prioritize the predictive factors shaping students' satisfaction in the Algerian university context.

This study seeks to address these gaps by examining the determinants of the student experience in distance learning at Hassiba Benbouali University of Chlef. It is distinguished by several original contributions. First, it proposes an empirical prioritization of predictive factors of student satisfaction, allowing the identification of priority action levers for institutions. Second, it integrates the variable « type of equipment » (computer vs smartphone), a dimension often neglected in studies on the digital divide but particularly relevant in the Algerian context, where mobile technologies are widely used to access digital learning environments.

The study is structured around three main research questions:

RQ1: What are the conditions of access to and use of DL by students, and how are these conditions distributed according to sociodemographic and academic characteristics?

RQ2: What factors (technical, human, pedagogical, institutional) determine students' overall satisfaction, and what is their relative weight in a multivariate model?

RQ3: What are students' preferences regarding future teaching modalities, and what implications do these preferences have for the design of training programs?

This study pursues three complementary objectives:

1. To describe the material, technical, and pedagogical conditions of DL as experienced by students.
2. To analyze the determinants of student satisfaction through cross-analyses and regression models.
3. To propose a DL integration model based on the articulation of three types of investments (infrastructural, human, and pedagogical).

2. Literature Review: Theoretical Framework of Distance Learning

2.1. Theoretical Foundations of Distance Learning

Distance learning is a field rich in theoretical conceptualizations. French law of 1971 simply defines it as "teaching followed without the presence of a teacher." For Peters (1973), it is "a form of communication of knowledge and skills rationalized by the division of labor, systematic organization, and the use of communication technologies." Moore (1973) sees it as "a family of educational methods where teaching is carried out separately from learning." Keegan (1986) synthesizes it into six characteristics: separation of teacher and learner, the role of the institution in planning and preparing teaching materials, use of technologies and media, interaction between teacher and learner, occasional face-to-face sessions, and the industrial form of teaching.

Moore (1993) developed the theory of transactional distance, postulating that distance in DL is not only geographical but also psychological and communicational. This transactional distance is determined by dialogue (interaction between teacher and learner) and structure (degree of program flexibility). This model finds an extension in the Community of Inquiry framework of Garrison (2000), which articulates three types of presence for an effective learning experience.

Table n° 01: Types of presence

Type of Presence	Definition	Key Dimension
Cognitive Presence	Ability to construct meaning through reflection and integration of knowledge	Knowledge construction
Social Presence	Ability to project one's personality into the learning community	Trust climate
Teaching Presence	Design, facilitation, and direction of cognitive and social processes	Pedagogical guidance

Source: Prepared by the authors

The Technology Acceptance Model (TAM) of Davis (1989) offers a complementary perspective. According to this model, the intention to use a technology is determined by perceived usefulness (belief that using it will

improve performance) and perceived ease of use (belief that its use will be effort-free). This theory, extended by Venkatesh et al. (2003) into the UTAUT model, allows analysis of how social and institutional factors influence the acceptance of DL platforms.

2.2. Success Factors of DL: Literature Synthesis

2.2.1. Technical and Infrastructural Factors

These include Internet connection quality (Helsper, 2017)and possession of appropriate equipment (Broadbent, 2015). In his study conducted at Hassiba Benbouali University of Chlef, (Kerrouzi, 2023)identifies connection problems as the main difficulty encountered by students. (Nasraoui, 2023) found that insufficient material resources constitute a major inequality factor.

2.2.2. Pedagogical Factors

The quality of course design is paramount. This involves producing relevant content (Jung, 2011), diversifying formats to address different learning styles (Mayer, 2014), and interactivity. (Bernard, 2009) confirmed that interactions between students and between students and teachers are among the major determinants of success. (Kerrouzi, 2023)emphasizes that the shift from synchronous teaching to a predominantly asynchronous process has profoundly impacted the teacher's role and severely tested learners' cognitive strategies.

2.2.3. Human Factors

Self-regulation and learner autonomy are crucial (Broadbent, 2015). (Djebbari, 2012), in his master's thesis on "Distance Learning: From Autonomy to Interaction," shows that even in a context of autonomous learning, the need to be guided and to interact with a tutor or peers is fundamental to maintaining motivation and preventing dropout. Prior training of teachers and students in the use of digital tools is a frequently overlooked success factor (Nguyen, 2015).

2.2.4. Institutional and Policy Factors

Institutional commitment involves a clear strategic vision, effective technical and administrative support (Paechter et al., 2010), and a continuing training policy. The methodological guide from the Algerian

Ministry of Higher Education and Scientific Research (MHESR, 2023) emphasizes the need for pedagogical, technical, and administrative support, with the establishment of monitoring entities and the formalization of codes of ethics. (Lassassi, 2020) reveals that despite the existence of national infrastructure, teachers encountered major difficulties due to lack of adequate institutional preparation.

2.3. DL in Algerian Universities: A Current Assessment

(Kerrouzi, 2023)highlights, in his study of the French Language Department at the University of Chlef, that Facebook, Google Meet, Classroom, Zoom, and Moodle platforms were mobilized as alternatives to face-to-face teaching during the COVID-19 period. His survey reveals a double tension: on the one hand, the need for teachers to carry out pedagogical activities; on the other hand, the need for students to be able to take their exams. These two imperatives were jeopardized by connectivity problems and the heterogeneity of available equipment.

The institutional response was rapid but incomplete. Although the Moodle platform was officially designated as the main tool, the massive use of Facebook and instant messaging demonstrates a gap between institutional prescriptions and actual practices — a finding consistent with Slimani's (2019) observations on the lag in Algerian teachers' appropriation of ICT in education.

2.4. Toward an Integrative Model

The synthesis of the literature allows us to propose an integrative model according to which student satisfaction (dependent variable) is determined by four categories of factors (independent variables): technical, pedagogical, human, and institutional. These factors are interdependent and interact within a dynamic system. This model will guide the analysis of data in this study.

3. Methodology

3.1. Research Approach

The study adopts a quantitative approach, combining descriptive and inferential statistical analyses (SPSS,v.22) to measure the magnitude of phenomena and identify determinants of the student experience.

3.2. Data Collection Method

The survey was conducted with 78 students at Hassiba Benbouali University of Chlef via an online questionnaire comprising 83 items structured into eight thematic sections:

Table n ° 02: Structure of the study questionnaire

Section	Theme	Number
1	Sociodemographic and academic data	6
2	Material conditions (equipment, connectivity)	8
3	Skills and prior training	5
4	Use of tools and platforms	10
5	Problems encountered and support received	10
6	Platform evaluation	8
7	Evaluation of pedagogical aspects	16
8	Overall satisfaction and preferences	5

Source: Prepared by the authors

Likert scales were 5-point (1 = strongly disagree / very dissatisfied; 5 = strongly agree / very satisfied).

3.3. Sample

Table n° 03: Sample Characteristics (n = 78)

Variable	Category	n	%
Gender	Women	60	76.9%
	Men	18	23.1%
Level	Bachelor's	44	56.4%
	Master's	30	38.5%
	Doctorate	3	3.8%
	Other	1	1.3%
Faculty	Economics	56	71.8%
	Medicine	6	7.7%
	Law	5	6.4%
	Foreign Languages	4	5.1%
	Exact Sciences	3	3.8%
	Others	4	5.2%

Source: Results of student survey, University of Chlef, 2026

3.4. Analysis Methods

The following statistical methods were used:

- Descriptive statistics (frequencies, means, standard deviations)
- Comparison tests (Chi-square, Student's t-test)
- Correlations (Pearson, Spearman) between variables
- Multiple linear regression to identify predictors of satisfaction

1. Quantitative Results

The presentation of the results follows the order of the three research questions formulated in the introduction. The first part addresses students' conditions of access and use of distance learning (RQ1), the second examines the determinants of student satisfaction (RQ2), and the third explores students' preferences regarding future teaching modalities and their implications for training program design (RQ3).

4.1. Conditions of Access to and Use of DL

This section addresses RQ1 by examining students' technical, material, and pedagogical conditions of access to distance learning, as well as the distribution of these conditions according to their academic characteristics and available resources.

4.1.1. Equipment

Table n° 04: Main Equipment Used by Students

Type of Equipment	Number (n)	Percentage (%)
Smartphone	56	71.8%
Computer (desktop or laptop)	19	24.4%
Tablet	1	1.3%
Multiple devices	2	2.5%
Total	78	100%

Source: Results of student survey, University of Chlef, 2026

The predominance of smartphones (71.8%) constitutes a structuring factor for analyzing difficulties encountered. This proportion reflects both

economic constraints — the personal computer remains a significant investment for many families — and established usage habits. This result confirms Kerrouzi's (2023) observations on the massive use of smartphones as the main tool for accessing online courses in the Algerian context.

4.1.2. Connectivity

Table n ° 05. Perceived Quality of Internet Connection

Perceived Quality	Number (n)	Percentage (%)
Very good	11	14.1%
Good	22	28.2%
Average	36	46.2%
Poor	9	11.5%
Total	78	100%

Source: Results of student survey, University of Chlef, 2026

Only 42.3% of students rate their connection as good or very good. The main connection type is 4G (69.2%), exposing students to coverage and stability issues, particularly in rural or peri-urban areas. (Kerrouzi, 2023)emphasizes that these connection problems constituted the main obstacle to pedagogical continuity during the pandemic at the University of Chlef.

4.1.3. Prior Training

Table n ° 06. Training Received Before Course Start

Type of Training Received	Yes (%)	No (%)
Reception of access credentials	57.7%	42.3%
Platform demonstration	42.3%	57.7%
Complete training (credentials + demonstration)	19.2%	80.8%

Source: Results of student survey, University of Chlef, 2026

Only 19.2% of students received complete training. These results reveal a major lack of initial support, likely to negatively affect the entire learning experience. This finding aligns with Djebbari's (2012) observations on the importance of support in building learner autonomy.

4.2. Problems Encountered

4.2.1. Frequency of Technical Problems

Table n° 07. Frequency of Technical Problems Encountered

Frequency	Number (n)	Percentage (%)
Never	3	3.8%
Rarely	7	9.0%
Sometimes	25	32.1%
Often	27	34.6%
Always	16	20.5%
Total	78	100%

Source: Results of student survey, University of Chlef, 2026

More than half of students (55.1%) encounter technical problems often or always. (Kerrouzi, 2023) had already observed this phenomenon at the same institution, noting that technical problems constituted a major obstacle to completing online pedagogical activities.

4.2.2. Types of Problems

Table n ° 08. Types of Technical Problems Encountered (Multiple Responses)

Type of Problem	Occurrences	% of Respondents
Slow Internet	37	71.2%
Platform problems (crashes, bugs)	20	38.5%
Connection drops	13	25.0%
Authentication problems	7	13.5%
Problems during exams	5	9.6%

Source: Results of student survey, University of Chlef, 2026

Slow Internet appears as the dominant problem, cited by more than seven out of ten students, confirming the critical importance of connectivity. This result is consistent with Kerrouzi's (2023) finding that students in the French department primarily reported Internet speed issues as an obstacle to participating in online courses.

4.3. Evaluation of the Platform and Pedagogical Aspects

4.3.1. University Platform Evaluation

Table n ° 09. University Platform Evaluation

Evaluation Criteria	Satisfied (%)	Neutral (%)	Dissatisfied (%)	Mean (/5)
Ease of access	33.3%	37.2%	29.5%	3.04
Ease of use	28.2%	38.5%	33.3%	2.92
Stability and reliability	23.1%	37.2%	39.7%	2.79
Interface clarity	30.8%	41.0%	28.2%	3.01

Source: Results of student survey, University of Chlef, 2026

Stability is the lowest-rated criterion (mean 2.79), confirming the technical difficulties mentioned earlier. Kerrouzi (2023) noted that the University of Chlef's Moodle platform experienced saturation during peak connection times, leading teachers to resort to alternative tools like Facebook and WhatsApp.

4.3.2. Pedagogical Evaluation

Table n°10. Evaluation of Pedagogical Aspects

Evaluation Criteria	Satisfied (%)	Neutral (%)	Dissatisfied (%)	Mean (/5)
Quality of online courses	37.2%	26.9%	35.9%	3.01
Ease of downloading	46.2%	21.8%	32.1%	3.15
Clarity of proposed activities	43.6%	28.2%	28.2%	3.18
Interaction with teachers	34.6%	26.9%	38.5%	2.87

Source: Results of student survey, University of Chlef, 2026

Interaction with teachers is the weakest point (mean 2.87), with nearly 40% of students dissatisfied. This result validates Djebbari's (2012) observations that, even in an autonomous learning context, the need for interaction with a tutor is fundamental to maintaining motivation. It also confirms Kerrouzi's

(2023) analysis of compensatory use of social networks to compensate for the lack of formal interaction on the platform.

4.4. Overall Satisfaction and Preferences

4.4.1. Overall Satisfaction

Table n ° 11. Overall Satisfaction Level with DL

Satisfaction Level	Number (n)	Percentage (%)
Very satisfied	5	6.4%
Satisfied	21	26.9%
Neutral	22	28.2%
Dissatisfied	20	25.6%
Very dissatisfied	10	12.8%
Total	78	100%

Source: Results of student survey, University of Chlef, 2026

Overall satisfaction is moderate: 33.3% satisfied or very satisfied, compared to 38.5% dissatisfied. The mean out of 5 is 2.85 (standard deviation 1.12). This below-average satisfaction level contrasts with results from initial surveys conducted at the very beginning of the pandemic, suggesting that after the emergency phase, students take a more critical view of the actual conditions of DL.

4.4.2. Future Preferences

This section addresses RQ3 by examining students' preferred teaching modalities and the implications of these preferences for the future design of higher education training programs in Algeria.

Table n °12. Preferred Teaching Mode for the Future

Teaching Mode	Number (n)	Percentage (%)
Hybrid teaching	44	56.4%
Exclusive face-to-face teaching	22	28.2%
Exclusive distance learning	12	15.4%
Total	78	100%

Source: Results of student survey, University of Chlef, 2026

The strong preference for hybrid teaching (56.4%) confirms that students neither support a complete return to traditional face-to-face teaching nor the full generalization of distance learning. Instead, they favor a balanced combination of both modalities. This result provides a direct answer to RQ3 and suggests that future training programs should adopt flexible hybrid models integrating online accessibility with face-to-face pedagogical interaction.

These findings imply several orientations for future program design. First, universities should develop hybrid pedagogical structures combining asynchronous online resources with regular synchronous and in-person sessions. Second, learning platforms and educational content should be optimized for smartphone use, given the predominance of mobile access among students. Third, future programs should incorporate systematic digital onboarding sessions and continuous technical support for both students and teachers. Finally, the design of training programs should place greater emphasis on interaction, collaborative activities, and pedagogical flexibility in order to maintain student engagement and reduce inequalities related to digital access.

The following analyses specifically address RQ2 by identifying the main technical, human, pedagogical, and institutional factors influencing students' overall satisfaction with distance learning.

4.5. Cross-Analyses

4.5.1. Internet Quality and Satisfaction

Table n ° 13. Satisfaction According to Perceived Internet Quality

Internet Quality	% Satisfied	% Neutral	% Dissatisfied
Very good	54.5%	36.4%	9.1%
Good	45.5%	36.4%	18.2%
Average	27.8%	27.8%	44.4%
Poor	11.1%	22.2%	66.7%

Source: Results of student survey, University of Chlef, 2026

The correlation between perceived Internet quality and overall satisfaction is strong ($r = 0.62$, $p < 0.001$). This result confirms the central

role of connectivity in the DL experience, as documented by Kerrouzi (2023) for the University of Chlef.

4.5.2. Training Received and Usage Difficulties

Table n°14. Training Received and Usage Difficulties

Training Received	Usage Difficulties (%)
Credentials + demonstration	18.2%
Credentials only	33.3%
No training	54.5%

Source: Results of student survey, University of Chlef, 2026

The difference is significant ($\chi^2 = 8.42$, $p < 0.01$). Trained students encounter three times fewer usage difficulties than those who received no training. This result argues for the generalization of initial support systems, as Djebbari (2012) already called for in his work on tutored support.

4.5.3. Equipment and Technical Problems

Table n°15. Frequent Technical Problems According to Equipment Type

Type of Equipment	Frequent Technical Problems (%)
Smartphone	62.5%
Computer	36.8%
Tablet	50.0%

Source: Results of student survey, University of Chlef, 2026

The difference between smartphone and computer is significant ($\chi^2 = 5.21$, $p < 0.05$). Smartphone users are nearly twice as likely to encounter frequent technical problems. Kerrouzi (2023) mentions this same observation, noting that many students at the University of Chlef do not have a PC and work only with their mobile phones, creating significantly degraded learning conditions.

4.5.4. Level of Study and Satisfaction

Table n°16. Satisfaction According to Level of Study

Level	% Satisfied	% Dissatisfied
Bachelor's	27.3%	43.2%
Master's	40.0%	33.3%
Doctorate	66.7%	0%

Source: Results of student survey, University of Chlef, 2026

The difference is significant ($\chi^2 = 6.74$, $p < 0.05$). Bachelor's students are significantly less satisfied. This result may be explained by greater autonomy, better mastery of tools, and more developed learning strategies among advanced students — what Djebbari (2012) calls "metacognitive skills" developed over years of study.

4.6. Multiple Regression: Predictors of Satisfaction

A multiple linear regression was conducted with overall satisfaction (scale 1-5) as the dependent variable. Independent variables include perceived Internet quality, training received (binary indicator), type of equipment (computer vs smartphone), evaluation of interaction with teachers, and level of study.

Table n °17. Multiple Linear Regression Results

Predictive Variable	Coefficient β	Standard Error	t	p	Significance
Perceived Internet quality	0.54	0.08	6.75	< 0.001	***
Prior training received	0.31	0.11	2.82	< 0.01	**
Type of equipment (computer)	0.24	0.10	2.40	< 0.05	*
Interaction with teachers	0.22	0.12	1.83	0.07	n.s.
Level of study (advanced)	0.18	0.09	2.00	< 0.05	*

Source: Results of student survey, University of Chlef, 2026

Adjusted $R^2 = 0.51$; $F(5,72) = 16.42$, $p < 0.001$ | *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; n.s. = not significant

The model explains 51% of the variance in satisfaction (adjusted $R^2 = 0.51$), which constitutes a high explanatory power. The three strongest predictors, in order of importance, are: Internet quality ($\beta = 0.54$), training received ($\beta = 0.31$), and type of equipment ($\beta = 0.24$). These results confirm the relevance of the proposed integrative model.

2. Discussion

The discussion is organized according to the three research questions guiding this study. The first part discusses inequalities in access and usage conditions (RQ1), the second analyzes the determinants of student satisfaction (RQ2), and the third examines the implications of students' preferences for the future design of higher education programs (RQ3).

5.1. Summary of Main Results

The survey reveals several major findings that confirm and enrich the literature:

-Unequal access conditions: The massive use of smartphones (71.8%) and the mediocre connection quality (57.7% average or poor) create significant disparities in the learning experience, confirming Kerrouzi's (2023) observations for the University of Chlef.

-Lack of prior training: More than half of students (57.7%) did not receive a platform demonstration, directly impacting their ability to use the tools — a finding consistent with Djebbari's (2012) works on the importance of tutored support.

-Recurrent technical problems: More than half of students (55.1%) encounter frequent technical problems, mainly related to slow Internet (71.2%) and platform crashes (38.5%), confirming results from Kerrouzi (2023) and Lassassi (2020).

-Moderate overall satisfaction: Only 33.3% of students report being satisfied, while 56.4% favor a hybrid model, aligning with Djebbari's (2012) conclusions that optimal DL maintains the interactive dimension of learning.

5.2. Validation of the Integrative Model

The results confirm the relevance of an integrative model. The regression model explains 51% of the variance in satisfaction, indicating good empirical fit. The ranking of factors by predictive weight is as follows: technical factors (Internet quality, $\beta = 0.54$), human factors (prior training, $\beta = 0.31$), technical factors (type of equipment, $\beta = 0.24$), pedagogical

factors teacher interaction (β = 0.22). This ranking has important implications for designing DL improvement policies.

5.3. Practical Implications

For University Institutions

-Technical infrastructure: Strengthen server capacities, develop connected spaces on campuses, negotiate reduced-rate student packages, develop a lightweight version of the platform for smartphones.

-Training and support: Organize mandatory platform onboarding sessions at the start of the academic year, create video tutorials, establish a responsive technical support service.

-Governance: Define a clear institutional policy for DL, coordinate practices among teachers, ensure regular communication with students.

For Teachers

-Prioritize the hybrid model (alternating face-to-face and distance learning).

-Diversify formats (videos, quizzes, forums, virtual classrooms).

-Organize regular synchronous sessions to maintain interaction.

-Adapt assessments to students' technical constraints.

6. Conclusion

6.1. Summary of Research Contributions

This study aimed to examine the determinants of the student experience in DL at Hassiba Benbouali University of Chlef. It employs an integrative theoretical framework combining the Community of Inquiry model (Garrison, 2000), the Technology Acceptance Model (Davis, 1989), and the success factors model (Bates, 2019).

From an empirical standpoint, the study establishes a precise diagnosis of DL access and usage conditions. Three major predictive factors were identified: perceived Internet connection quality (β = 0.54), prior training received (β = 0.31), and type of equipment used (β = 0.24). These results confirm that the digital divide is not reducible to the binary opposition

"connected/not connected" but includes gradations related to equipment quality, connection stability, and mastery of usage.

From a theoretical perspective, the research validates the relevance of an integrative model combining multiple analytical frameworks. It contributes to understanding the digital divide in Global South countries by highlighting the differentiated effect of equipment type, a dimension often neglected in previous work.

6.2. Implications for Educational Policies

Three priority orientations emerge, corresponding to the three major predictors identified:

-Priority to connectivity infrastructure (β = 0.54): Investment efforts must focus first on improving network coverage and stability, both nationally and institutionally. Agreements with operators for reduced-rate student packages could help reduce access inequalities.

-Generalization of prior training (β = 0.31): It is imperative to organize mandatory onboarding sessions at the start of each academic year, supplemented by video tutorials. This training should not be limited to technical aspects but should also include elements of distance learning methodology (time management, self-regulation).

-Adaptation of platforms to actual usage patterns (β = 0.24): The predominance of smartphones (71.8%) requires adaptation of interfaces and content formats. Platforms must be optimized for mobile consultation, with lightweight content and interactive formats adapted to small screens.

The study also provides a direct response to RQ3 concerning the future design of higher education programs. The preference expressed by most students for hybrid teaching demonstrates that future university models in Algeria should combine the flexibility of distance learning with the pedagogical and social benefits of face-to-face interaction. Consequently, future training programs should be designed around hybrid pedagogical approaches integrating mobile-compatible platforms, diversified digital content, regular interaction sessions, and structured digital support

mechanisms. Such an approach would allow universities to improve educational quality while reducing inequalities in access and participation.

6.3. Study Limitations

The sample size (78 respondents) remains modest. The overrepresentation of economics disciplines (71.8%) and the single-site nature of the study limit the generalizability of conclusions. The data relies on subjective self-reports not controlled by objective measures. Finally, the volunteer sample may introduce selection bias.

6.4. Research Perspectives

Several avenues merit exploration: (1) a multi-site study at the national level to capture the diversity of Algerian university situations; (2) a longitudinal analysis of DL effects on learning outcomes and persistence; (3) action research testing different prior training modalities; (4) an in-depth study of territorial inequalities between urban and rural areas; (5) a comparative study with other Maghreb and sub-Saharan African countries. At the conclusion of this research, distance learning appears as a revealer of the structural inequalities that run through the Algerian education system. The difficulties encountered by students are not merely occasional technical problems; they reflect inequalities in infrastructure, training, and cultural capital that DL has helped to bring to light.

The future lies in a thoughtfully integrated approach within a hybrid model, favored by 56.4% of students. This hybridization must be accompanied by three complementary types of investment: infrastructural (connectivity, equipment), human (training of students and teachers), and pedagogical (diversification of formats, maintenance of interaction, adaptation of assessments). The challenge is to make distance learning a lever for democratization and quality, rather than an additional factor of inequality.

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