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Assessing the Quality of Digital Services in University Education from a Multi-Stakeholder Perspective: A Strategic Analysis Using the SWOT Matrix

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Abstract

This study set out to assess the quality of digital services in university education at Batna 1 University, looking at it from the perspectives of faculty, students, and administrators using a strategic analysis based on the SWOT matrix. A descriptive-analytical approach was employed, with data collected through semi-structured interviews from a purposive sample of 76 participants. Content analysis was used to group responses into four main themes, after which the SWOT matrix was applied to calculate weighted scores for strengths, weaknesses, opportunities, and threats. The findings pointed to several strengths, most notably the way digital tools have simplified pedagogical and administrative processes. Against that, significant weaknesses emerged, particularly poor internet connectivity and a lack of prior training. The study also identified promising opportunities, such as effective student engagement, alongside challenges including the need to adapt the legislative environment. The final weighted scores produced a negative value (-0.60), indicating that digital service quality remains low from the participants' perspective. The study concluded with a set of strategic recommendations focused on infrastructure development, strengthening digital culture, and amending regulations to support the desired quality standards.

Keywords: digital service quality, university education, strategic SWOT analysis, multi-stakeholder evaluation

Introduction

Digital transformation is reshaping nearly every sector, and higher education is no exception. Universities today face growing pressure to keep up; this is necessary not just to stay relevant, but to ensure that what they deliver meets acceptable standards of quality and efficiency. Over the past several years, global crises have pushed academic institutions to accelerate their adoption of digital learning tools and electronic services. What was once a strategic choice has now become an unavoidable necessity (Glushenkova & Zagato, 2023).

Mexhuani (2025) points out that digital transformation in higher education brings real opportunities: expanded access, more personalized learning, and stronger

collaboration. But it also comes with serious challenges. These include the digital divide, faculty resistance, and concerns about data privacy.

Algeria has been working along these lines as well. The Ministry of Higher Education and Scientific Research launched an ambitious digitalization project aimed at modernizing the sector, putting in place modern administrative and pedagogical systems, and achieving a "Zero Paper" goal (Ministry Statement, May 2, 2023). Several digital platforms have been introduced, including PROGRES and Moodle (Digitalization Roadmap, 2022). Still, digital transformation involves more than just setting up technological infrastructure. It also demands that the services provided to faculty, students, and administrators actually work well. Digital service quality is defined as the overall effect of service performance that determines the degree of user satisfaction (ITU-T Recommendation E.800, 2008).

Researchers have proposed various models to capture the dimensions of this quality. For instance, Menezes et al. (2016) identified five key dimensions: trust, convenience, responsiveness, empathy, and personalization. Their findings indicated that trust, responsiveness, and empathy were directly linked to overall satisfaction with electronic services. Similarly, a more recent study by Nguyen et al. (2025) conducted in Vietnam demonstrated that four service quality dimensions, specifically tangibles, reliability, assurance, and empathy, had a significant impact on student engagement, motivation, and satisfaction.

For strategic analysis, the SWOT matrix is a useful tool. It helps assess current conditions by examining the internal environment (strengths and weaknesses) alongside the external environment (opportunities and threats). This makes it easier to set priorities and make informed strategic decisions (Toumi, 2020). Chsherbakova et al. (2025) applied this approach to blended learning in Kazakh higher education institutions. Their findings highlighted strengths such as flexibility and accessibility, weaknesses like the lack of direct interaction, opportunities for accessing global education, and threats including social isolation.

Earlier studies have looked at digitalization in higher education from different angles. Hawamid (2024) explored its role in achieving educational quality and sustainable development. Belloul (2023) concentrated on the legislative challenges surrounding the "Zero Paper" initiative. Singun (2025) conducted a systematic review of barriers to digital transformation, classifying them into nine main dimensions and eighty sub-dimensions. Zidan (2021) used SWOT analysis to assess the digitalization project at Al-Azhar University.

Despite these efforts, the Algerian experience continues to face considerable obstacles. Weak telecommunications infrastructure, limited digital skills among some stakeholders, a lack of prior training, and occasionally unclear strategies have all been noted as persistent issues (Madfouni, 2021; Sualhia & Guarrard, 2023).

This study aims to fill a gap in the existing literature. Few field-based studies have evaluated digital service quality in Algerian

universities using an integrated approach that combines qualitative content analysis with quantitative assessment through the SWOT matrix, while also including diverse target groups (faculty, students, administrators, digitalization officers) at an important juncture, several years after the digitalization project was launched.

This study is significant for several reasons. Primarily, it addresses a timely issue regarding digital service quality at a moment when Algeria is pursuing comprehensive digital transformation. Its methodological design, which integrates content analysis with the SWOT matrix, makes it possible to assess the situation objectively from multiple viewpoints. The findings should be useful to decision-makers and quality assurance units as they work to develop realistic and effective improvement strategies. More specifically, this research seeks to uncover the current state of digital service quality at Batna 1 University, identify internal strengths and weaknesses, explore external opportunities and threats, and produce a quantitative SWOT analysis to help set strategic priorities.

The gap between digital ambitions and on-the-ground realities led us to the following central research question: How can the quality of digital services in university education be evaluated objectively and comprehensively from the users' perspective? From this main question, five sub-questions follow:

1. What is the current state of digital service quality at Batna 1 University from the perspective of users (faculty, students, administrators, and digitalization officers)?
2. What are the most prominent strengths of digital services at Batna 1 University from the users' perspective?
3. What are the main weaknesses affecting digital services at Batna 1 University from the users' perspective?
4. What are the most important opportunities in the external environment that can be leveraged to improve digital service quality at Batna 1 University?
5. What are the major challenges facing digital services at Batna 1 University in the external environment?

1. Research Methodology

1.1 Research Design

This study used a descriptive-analytical approach. The aim was to describe the phenomenon as it actually exists by collecting data, analyzing it, and drawing objective conclusions based on what was observed.

1.2 Population and Sample

The target population comprised all digital service users and digitalization officers at Batna 1 University. From this population, a purposive sample of 76 individuals was selected.

The sample size may appear modest relative to the total population. However, in studies aimed at constructing a SWOT matrix for

strategic analysis, the emphasis is less on statistical representativeness and more on the quality of information and depth of field expertise. A purposive sampling strategy was therefore appropriate. The sample focused on four key groups (faculty members, students, administrators, and digitalization officers) since these stakeholders are most familiar with the actual functioning of digital services. Their perspectives, even from a limited number of participants, offer sufficient depth to support a rigorous strategic analysis. Table 1 presents the distribution of the sample.

Table 1: Distribution of the Study Sample

Sample Category	Count	Affiliation
Faculty Members	19	Various faculties (Social Sciences, Humanities, Architecture)
Students	36	Various faculties and departments
Administrators	09	Officials in charge of "PROGRES" and "Moodle" platforms
Digitalization Officers	12	Engineers, technicians, and supervisors of digitalization cells
Total	**76**	

1.3 Research Tools

1.3.1 Semi-Structured Interview

The researcher developed an interview guide containing open-ended questions tailored to each category of participants. The questions were designed to explore respondents' views on the strengths, weaknesses, opportunities, and threats related to digital services. Individual interviews were conducted with each participant. These interviews were recorded and later transcribed for analysis.

1.3.2 Content Analysis

Once the interviews were transcribed, content analysis was used to classify the responses into key thematic ideas, also referred to as coding units, within the four SWOT domains: strengths, weaknesses, opportunities, and threats. Frequencies and percentages were calculated for each theme to determine the significance and prevalence of each factor among participants.

1.3.3 SWOT Matrix

An integrated methodological design was adopted, combining the depth of qualitative analysis with the precision of quantitative measurement. After twenty key themes were extracted from the content analysis, they were used as the main inputs for a quantitative SWOT matrix. Participants were asked to assign a weight to each theme based on its perceived impact. This process turned qualitative insights into numerical values that could be compared, making it possible to identify genuine priorities for intervention and development. Singh and Yadav (2023) affirm that integrating content analysis with the SWOT matrix in a sequential methodological design represents a sound scientific practice, as the former generates ideas from the stakeholders themselves, while the latter evaluates these ideas and prioritizes them using objective quantitative tools. This methodological integration produces a comprehensive and reliable assessment that enables decision-

makers to direct limited resources toward addressing the highest-priority factors, rather than distributing efforts arbitrarily.

Drawing on the results of the content analysis, a SWOT matrix was constructed to evaluate digital services quantitatively. The process followed these steps (Toumi, 2020, p. 177):

1. **Identifying factors.** The most significant factors within each of the four SWOT domains were listed.
2. **Assigning relative weights.** Each factor was given a relative weight ranging from 0 to 1, with the total weight for each domain not exceeding 1. The weight reflected the factor's degree of influence on service quality.
3. **Rating performance.** Each factor was rated on a scale from 1 to 5 based on current service performance, where 1 indicated very poor and 5 indicated excellent.
4. **Calculating weighted scores.** The relative weight of each factor was multiplied by its rating to produce a weighted score.
5. **Calculating total scores.** Weighted scores for strengths, weaknesses, opportunities, and threats were summed. Subtractions were then performed—total strengths minus total weaknesses, and total opportunities minus total threats—to determine the overall strategic position.

2. Results

2.1. Results of the First Question

Question 1: What is the current status of digital service quality at Batna 1 University from the perspective of users (faculty, students, administrators, and digitalization officers)?

Content analysis of the respondents' feedback revealed 20 primary themes distributed across four domains. These themes generally showed high frequency rates (ranging between 63% and 100% for most ideas), confirming their significance and validity in representing the sample's views. Table 2 summarizes these themes.

Table 2: Frequency of Analysis Categories and Proposed Themes Based on Respondent Feedback

Domain	Key Themes Identified	Frequency	Percentage
Strengths	Saving time and effort, reducing bureaucratic costs, transparency, facilitating pedagogical and administrative processes, skill development.	20–76	26%–100%

Weaknesses	Poor internet bandwidth, low digital proficiency and skills, lack of prior training, inability to master platforms, faculty resistance to additional tasks.	19–76	25%–100%
Opportunities	Establishing extensive networks aligned with ICT developments, self-directed learning, activating IT centers, effective student engagement, structuring the digital system.	18–48	24%–63%
Threats (Challenges)	Adapting the legislative environment, fundamental shifts in the educational process and policy-making, training and qualification, adopting a digital transformation culture, developing local software.	31–56	41%–74%

2.2. Results of the Second Question

Question 2: What are the most prominent strengths characterizing digital services at Batna 1 University from the users' perspective?

To answer this question, the primary themes were integrated into the SWOT matrix for quantitative evaluation. The following table illustrates the weighted scores for the Strengths domain.

Table 3: Relative and Weighted Scores for Strengths

No.	Strengths	Relative Weight	Rating	Weighted Score
01	Facilitating pedagogical and administrative processes	0.15	3	0.45
02	Cost reduction	0.10	4	0.40
03	Transparency	0.10	4	0.40
04	Saving time and effort	0.05	5	0.25
05	Skill development	0.05	3	0.15
Total Strengths Score		**1.65**		

2.3. Results of the Third Question

Question 3: What are the primary weaknesses affecting digital services at Batna 1 University from the users' perspective?

To address this question, the key themes were integrated into the SWOT matrix for quantitative assessment. The following table details the weighted scores for the Weaknesses domain.

Table 4: Relative and Weighted Scores for Weaknesses

No.	Weaknesses	Relative Weight	Rating	Weighted Score
01	Lack of prior training	0.20	5	1.00
02	Poor internet bandwidth	0.15	5	0.75
03	Inability to master platforms	0.10	3	0.30
04	Low digital proficiency and skills	0.05	4	0.20
05	Faculty resistance to additional tasks	0.05	3	0.15
Total Weaknesses Score		**2.40**		

2.4. Results of the Fourth Question

Question 4: What are the most significant opportunities available in the external environment that can be leveraged to improve the quality of digital services at Batna 1 University?

The primary themes were evaluated quantitatively using the SWOT matrix. The following table illustrates the weighted scores for the Opportunities domain.

Table 5: Relative and Weighted Scores for Opportunities

No.	Opportunities	Relative Weight	Rating	Weighted Score
01	Effective student engagement	0.20	4	0.80
02	Structuring the digital system	0.15	4	0.60
03	Establishing extensive (technological) networks	0.10	5	0.50
04	Self-directed learning for users	0.05	3	0.15
05	Activating the role of IT centers	0.05	2	0.10
Total Opportunities Score		**2.15**		

2.5. Results of the Fifth Question

Question 5: What are the major challenges facing digital services at Batna 1 University within the external environment?

The key themes for the Challenges (Threats) domain were quantitatively assessed. The results are presented in the table below.

Table 6: Relative and Weighted Scores for Challenges

No.	Challenges	Relative Weight	Rating	Weighted Score
01	Adapting the legislative environment	0.10	5	0.50
02	Fundamental change in the educational process	0.10	4	0.40
03	Developing strategic policies and effective applications	0.10	4	0.40
04	User training and qualification	0.10	4	0.40
05	Adopting a digital transformation culture and local software production	0.10	3	0.30
Total Challenges Score		**2.00**		

2.6. Overall Strategic Analysis

To determine the overall strategic position of digital services, the subtraction operations were performed as shown in the following table:

Table 7: Results of Weighted Score Subtractions for Internal and External Environments and the Strategic Decision

Overall Strategic Position Based on Results	Subtraction Results	
Strategic decision-makers will proceed based on the following: - Clarifying the weaknesses that have a significant impact on the decline of digital service quality. - Presenting the most important opportunities available to the university that will substantially assist in executing strategic decisions. - Providing necessary recommendations and guidelines to address the negative result (weaknesses), which will help strengthen the university's internal position in the future.	**Internal Environment**	**External Environment**
	∑ S (Strengths) - ∑W (Weaknesses) = 1.65−2.40=−0.75	∑ O (Opportunities) - ∑T (Challenges) = 2.15−2.00=0.15
	Negative	**Positive**
	Final Result = 0.15 - (-0.75) = -0.60 (**Negative**)	

Since the overall result is negative, this indicates that the level of digital service quality at Batna 1 University is low from the perspective of the study sample. This is

because the impact of internal weaknesses outweighs the impact of strengths, despite the presence of promising external opportunities that could be leveraged.

3. Discussion

3.1 Discussion of Research Question One

Content analysis of the interviews yielded 20 key themes distributed across the four SWOT domains. Frequency rates ranged from 63% to 100%. This high level of consensus suggests that participants had a well-developed understanding of digitalization at Batna 1 University. They acknowledged the gains that had been made, but they also pointed to obstacles and challenges, while remaining cautiously optimistic about the opportunities ahead.

This pattern is consistent with earlier studies that used content analysis to generate key themes directly from stakeholders. Krippendorff (2018) notes that content analysis is a well-established method for extracting meaning from texts by treating them as communicative data interpreted within their social contexts. Elo and Kyngäs (2008) similarly highlighted the value of qualitative content analysis in generating categories and key concepts from text, particularly when the goal is to build a deep understanding of a phenomenon from participants' own perspectives.

Still, content analysis alone does not fully meet the demands of strategic decision-making. It identifies factors but does not assign relative weights or indicate degrees of impact (Gürel & Tat, 2017). There is a fundamental difference between identifying factors and ranking them. For example, the analysis shows that "poor internet connectivity" and "lack of prior training" are prominent weaknesses. But it does not tell us which one has a greater impact on quality, and therefore which should receive priority in improvement plans. This limitation of qualitative analysis has been noted in the strategic planning literature on higher education (Hunsanimitkul, 2020; Shinno et al., 2006). Krippendorff (2018) adds that while content analysis provides inferences about the phenomenon under study, the strength of those inferences depends on the clarity of the analytical framework and the degree to which the methodology is integrated.

In this study, the 20 extracted themes served as strategic inputs that were then subjected to quantitative evaluation using the SWOT matrix. This allowed us to determine their relative weights and priorities, moving from descriptive diagnosis toward strategic planning grounded in precise quantitative foundations.

3.2 Discussion of Research Question Two

The findings reveal a gap between the theoretical understanding of digitalization and how it actually plays out in practice at the university. Looking at strengths (Table 3), "facilitating pedagogical and administrative processes" received the highest weighted score (0.45). This aligns with the stated goals of digitalization and with Shehata's (2022) findings on improvements in academic performance.

"Cost reduction" and "transparency" also emerged as clear gains from digitalization, a point reinforced by Hawamid

(2024). This can be explained by the flexibility that digital platforms have introduced into everyday transactions. These results are also consistent with Mishra et al. (2025), who found that institutional service quality has a positive effect on student engagement and satisfaction.

3.3 Discussion of Research Question Three

Turning to weaknesses (Table 4), the highest weighted scores went to "lack of prior training" (1.00) and "poor internet connectivity" (0.75). These figures point to a real challenge: a digital system was put in place without first preparing the people who would have to use it.

This finding matches what Singun (2025) reported in a systematic review of barriers to digital transformation, where "low digital proficiency" and "lack of digital resources" were classified as major obstacles. In addition, "low digital proficiency and skills" and "faculty resistance" suggest a resistance to change that may stem from a lack of incentives and the burden of added responsibilities. Mexhuani (2025) documented a similar phenomenon in his study on the challenges of adopting digital tools.

3.4 Discussion of Research Question Four

When it comes to opportunities (Table 5), "effective student engagement" (0.80) and "structuring the digital system" (0.60) stand out as the most significant prospects. Activating these opportunities could bring about a qualitative shift. Doing so would mean moving students from a passive receiving role to an active role in the digital learning process. It would also involve improving platform designs to make them more user-friendly and efficient.

Menezes et al. (2016) emphasized the importance of dimensions such as convenience and personalization in enhancing electronic service quality and user satisfaction—a point that supports the findings here.

3.5 Discussion of Research Question Five

As for threats (Table 6), "adapting the legislative environment," "making fundamental changes," and "building strategic policies" each received weighted scores of 0.50. These figures suggest that successful digitalization depends on more than just technical factors. It also requires political, legislative, and strategic support at the highest levels. This aligns with the framework proposed by Singun (2025), which identified "digital vision and strategy" and "policies" as essential dimensions for successful digital transformation in higher education institutions.

3.6 Discussion of the Overall Result

The negative overall result of –0.60 can be explained by the gap between the centralized strategic direction coming from the supervisory ministry and the operational realities at the university. Ministerial directives push for the rapid and comprehensive implementation of digitalization (Ministry of Higher Education and Scientific Research, 2020), such as Instruction 1792 concerning the activation of the Moodle platform. However, this push runs up against a lack of training, weak infrastructure, and insufficient cultural readiness among some users (Madfouni,

2021, pp. 196–200; Mahfoudhi, 2021, p. 74). Mexhuani (2025) underscored the importance of strategic planning and continuous professional development in maximizing the benefits of digital education and overcoming such challenges (Mexhuani, 2025).

Thus, digital services are used in a compulsory and mechanical manner, without reaching a level of quality that would satisfy users and turn them into active drivers of continuous improvement. The study by Nguyen et al. (2025) confirms that a positive service environment creates a dynamic that enhances student commitment, engagement, and academic performance, a principle that also applies to faculty and administrators (Nguyen et al., 2025). This situation calls for a reconsideration of the implementation strategy to make it more gradual and attentive to the local context.

Conclusion

This study found that the quality of digital services at Batna 1 University, from the perspective of users and administrators alike, remains below the required standard. Internal weaknesses, such as the lack of training and poor internet connectivity, outweigh the strengths, even though promising external opportunities exist that could be leveraged. The shortfall stems primarily from the gap between rapid centralized strategies and the actual readiness of the university environment in terms of infrastructure, human competencies, and digital culture. These findings are consistent with recent international studies on the challenges of digital transformation in higher education institutions (Mexhuani, 2025; Singun, 2025).

Recommendations

Based on the findings, the study offers the following recommendations.

Procedural Recommendations for Decision-Makers at the University and Ministry

1. Infrastructure development. Urgent action should be taken to improve internet networks and increase bandwidth across the university and its faculties. Effective agreements with telecommunications providers should also be established.

2. Comprehensive and mandatory training. Compulsory, ongoing training programs should be designed and implemented for faculty, administrators, and students on the fundamentals of digitalization and the use of educational platforms. Certified credentials should be awarded upon completion.

3. Legislative environment reform. A specific law governing digitalization and electronic transactions in higher education should be enacted to regulate processes, define responsibilities, guarantee rights, and encourage innovation. Particular attention should be paid to the dimensions of trust and security highlighted in previous research.

4. Encouraging interaction. A percentage of continuous assessment marks should be allocated to students in exchange for active engagement on distance learning platforms such as Moodle. Moral and material incentives should also be offered to faculty

members who demonstrate excellence in digital utilization.

5. Investing in opportunities. Partnerships with the Ministry of Communication and specialized bodies should be activated to develop local software tailored to the needs of Algerian universities. Emphasis should be placed on dimensions such as convenience and personalization, which increase user satisfaction.

Research Recommendations

1. Similar studies should be conducted at other Algerian universities to allow for comparison and broader generalization of findings.

2. The integrative model combining content analysis and the SWOT matrix should be applied to other digital projects or to specific dimensions of quality, such as digital content quality.

3. Future studies should focus on measuring the impact of the proposed training programs on improving digital service quality, drawing on international models for service quality measurement.

4. Because this study relied on a purposive sample of limited size to enable strategic SWOT analysis and in-depth exploration of stakeholders' views, it opens the door for further research. Future studies using descriptive-analytical approaches with larger, more representative samples are recommended. Such studies would allow for precise quantitative measurement of digital service quality indicators and strengthen the generalizability of findings across the entire university.

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