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Assessing the Impact of Digitalization on the Improvement of Educational Quality in Higher Education Institutions: A Case Study of Herat University (2025)

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Article History:
Received: 05. 02.2026
Accepted: 18. 02.2026
Online First: 20.03.2026

Citation:
Amiry, M.H. Azimi, M.S. & Saljuqi, A.F. (2026). Assessing the Impact of Digitalization on the Improvement of Educational Quality in Higher Education Institutions: A Case Study of Herat University (2025). *Kdz Uni Int J Islam Stud and Soc Sci*; 3 (1):1-23

e-ISSN: 3078-3895

Abstract

Digitalization has become a crucial factor in enhancing educational quality in higher education institutions worldwide, yet in Afghanistan, empirical evidence on its effects remains limited. This study investigates the impact of digitalization on educational quality at Herat University, aiming to identify key benefits, challenges, and areas for improvement. A quantitative research design was employed, and 203 structured questionnaires were distributed among faculty members and administrative staff. The survey instrument included sections on demographic information, awareness of digitalization, its perceived impact on teaching and learning, challenges and limitations, and the role of digital systems in administration. Data were analyzed using descriptive statistics and reliability tests in SPSS. The results indicate that faculty and staff generally have moderate to high awareness of digitalization, which positively influences teaching practices, learning outcomes, and institutional management. Challenges such as limited infrastructure, insufficient training, and resistance to change were identified as barriers to full implementation. Participants also emphasized the importance of digital systems in improving administrative efficiency and decision-making processes. The study concludes that digitalization can significantly enhance educational quality if supported by adequate policies, infrastructure, and training programs. This research provides empirical evidence on the role of digital technologies in Afghan higher education and offers practical recommendations, including enhancing digital literacy, centralizing digital platforms, and allocating sustainable resources to support technological advancement.

Keywords: Digitalization, Educational Quality, Higher Education, Herat University.

Introduction

In recent decades, digitalization has emerged as one of the most transformative forces in education, fundamentally reshaping how learning is delivered, accessed, and evaluated (UNESCO, 2020). Globally, higher education institutions are increasingly adopting digital

solutions to enhance access, quality, efficiency, and learner satisfaction (OECD, 2021). The COVID-19 pandemic further accelerated this process, as universities were compelled to shift rapidly to online teaching, highlighting both the opportunities and challenges associated with digital transformation (Bozkurt et al., 2020). Digitalization in higher education aims primarily at improving learning outcomes, student engagement, teaching effectiveness, and institutional management. Tools such as learning management systems, digital libraries, online assessments, and academic information systems provide more flexible, student-centered education while supporting transparency and quality assurance (Bates, 2019).

In Afghanistan, higher education institutions face significant challenges in digital adoption, including limited infrastructure, unstable internet connectivity, and insufficient digital skills among faculty and administrative staff (Ahmadi & Rahimi, 2022). Despite these barriers, universities such as Herat University have initiated digital programs, including academic registration systems and e-learning platforms. However, the extent to which these initiatives contribute to improving educational quality remains underexplored. This research seeks to address this gap by investigating the impact of digitalization on educational quality at Herat University, focusing on how digital tools influence teaching, learning, academic services, and institutional management, while also identifying challenges that hinder full digital integration.

The main objective of this study is to assess the effect of digitalization on enhancing educational quality in higher education institutions, particularly considering the perspectives of academic and administrative staff at Herat University. The sub-objectives include examining the level of digital literacy and awareness among staff, evaluating the impact of digital technologies on teaching and learning quality, and identifying major challenges and limitations in the digitalization process. Based on these objectives, the research hypotheses are as follows: academic and administrative staff at Herat University possess moderate to high awareness of digitalization; digitalization positively influences teaching and learning quality; it improves administrative efficiency; and limitations such as inadequate infrastructure, insufficient training, and resistance to change negatively affect effective implementation.

The study is guided by the main research question: what is the impact of digitalization on improving educational quality in higher education institutions, with a case study of Herat University? Sub-questions explore the familiarity of staff with digital tools, the effect of digital systems on teaching and learning accessibility and quality, challenges faced by staff in the digitalization process, and the role of digital systems in enhancing administrative efficiency. By addressing these questions, the study provides empirical evidence on the role of digitalization in higher education in Afghanistan and offers recommendations to optimize its implementation and outcomes.

Ismailova et al. (2022) examined selected universities in Uzbekistan and found that access to digital platforms significantly improved course delivery, student communication, and administrative transparency. The study identified infrastructure and digital literacy as critical mediating factors. Similarly, UNESCO (2021) reported that universities implementing Learning Management Systems (LMS), online assessments, and digital libraries experienced higher student satisfaction and academic performance, although disparities in adoption persisted due to limited infrastructure and resistance to change. OECD (2020) also emphasized that embedding digital systems across academic and

administrative functions enhances alignment with quality assurance goals, highlighting the need for faculty and staff training in digital competencies.

In Afghanistan, research on digitalization in higher education remains limited. The Ministry of Higher Education (MoHE, 2022) reported that while some progress has been made—such as online registration and grading systems—many institutions still face inadequate infrastructure, low technical capacity, and limited policy support. At Herat University, internal evaluations indicate that platforms like Google Classroom and Moodle are increasingly used, though adoption varies across faculties. Some departments have integrated digital tools into teaching and administration, while others continue to rely on traditional methods, reflecting global patterns of uneven digital transformation.

Material and Method

Research Design

This study employed a descriptive and quantitative research design to investigate the impact of digitalization on educational quality at Herat University. The chosen design allowed for the systematic collection and statistical analysis of data, focusing on the experiences and perceptions of faculty and administrative staff regarding the use of digital systems in educational and administrative processes. This design provides a structured approach to measure relationships and differences while ensuring objectivity and reproducibility.

Study Area

The study was conducted at Herat University, Afghanistan, encompassing multiple academic departments and administrative units. The university was selected due to its ongoing digital initiatives, including e-learning platforms and academic management systems, which make it an appropriate case for evaluating the influence of digitalization on higher education quality.

Participants

The target population included academic staff and administrative employees of Herat University. To ensure representativeness across different departments, a stratified random sampling method was employed. Strata were defined based on staff category (faculty vs. administration) and departmental affiliation. Ethical approval for the study was obtained from the university administration, and informed consent was collected from all participants prior to data collection.

Sample Size Estimation

According to Herat University records, the total population consisted of approximately 275 faculty members and 154 administrative staff. Using the Raosoft Sample Size Calculator with a 5% margin of error, a 95% confidence level, and a 50% response distribution, the minimum recommended sample size was determined to be 203 respondents.

Data Collection Methods

Data were collected using a structured questionnaire developed based on the conceptual framework and literature review. The questionnaire consisted of five sections: (1) Respondent demographic data including role, years of experience, work field, education level, and field of study; (2) Level of familiarity with digitalization in the educational environment; (3) Perceived effect of digitalization on educational quality; (4) Challenges encountered during the digitalization process; and (5) Role of digital systems in

administrative affairs. The questionnaire was distributed in person to selected participants following ethical approval and informed consent procedures.

Data Analysis

Collected data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were employed to summarize demographic information and awareness levels, while inferential statistical methods were applied to examine the impact of digitalization on educational quality and administrative efficiency. All statistical analyses were clearly reported, ensuring transparency and reproducibility of the results.

Findings

A questionnaire was distributed among the staff of Herat's University to gather insights into their experiences and opinions regarding Assessing the Impact of Digitalization on the Improvement of Educational Quality in Higher Education Institutions at Herat University. The results from these questionnaires provide valuable information on current practices and areas for improvement.

Respondent Information

In this section, we gathered details about the respondents, including their positions, years of experience, areas of activity, field of study, and educational degrees.

Position of Respondent

Table 1. The percentage of respondents who were given the questionnaire at Herat University

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Teacher	153	75.4	75.4	75.4
Employ	50	24.6	24.6	100.0
Total	203	100.0	100.0	

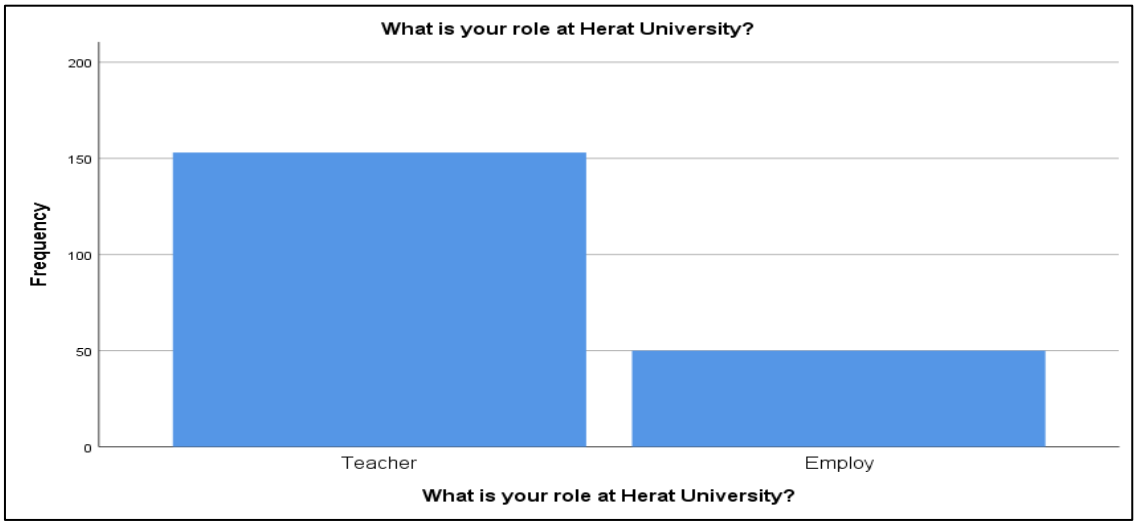

Figure 1. The percentage Position of the Respondents.

Years of Experience

The employees who were given the questionnaire at Herat University had varying levels of work experience, ranging from one year to 32 years. The majority of them had less work experience, with their average experience being as follows.

Table 2. Show the minimum and maximum years of work experience

	N	Minimum	Maximum	Mean
How many years of work experience do you have?	203	1	32	6.55

Field of Respondent

Of the 203 completed questionnaires, 62.1% were engaged in teaching, 21.2% in administration, and 16.7% in research.

Table 3. Show the percentage field of respondents who were given the questionnaire

Valid	Frequency	Valid Percent
Teaching	126	62.1
Administration	43	21.2
Research	34	16.7
Total	203	100.0

Major of Respondent

Table 4. Show the percentage the Major of respondent who were given the questionnaire

Educational Major of people who received the questionnaire.		Frequency	Valid Percent
Valid	Dentistry	1	.5
	Journalism	4	2.0
	Literature	1	.5
	Public Administration	7	3.4
	Science	2	1.0
	Social Sciences	1	.5
	Veterinary	1	.5
	Agriculture	6	3.0
	Applied Science	3	1.5
	Computer Science	22	10.8
	Dentistry	9	4.4
	Economics	34	16.7
	Education	6	3.0
	Engineering	12	5.9
	FineArts	11	5.4
	Humanities	6	3.0
	Islamic Studies	6	3.0
	Journalism	1	.5
	Law	22	10.8
	Literature	14	6.9

	Medicine	4	2.0
	Public Administration	13	6.4
	Science	3	1.5
	Social Sciences	9	4.4
	Veterinary	5	2.5
	Total	203	100.0

According to the table, the largest contributions were from economics (16.7%), computer science (10.8%), and law (10.8%). This was followed by public administration (9.8%), literature (7.4%), engineering (5.9%), fine arts (5.4%), and several departments with smaller contributions. This disciplinary diversity is useful for generalizing the results at the university level.

Educational Degree

The people who received the questionnaire all had a university degree. Most of them, 52.7 percent, had a master's degree, 31 percent had a bachelor's degree, and 16.3 percent had a doctorate.

Table 5. Show the percentage the educational degree of respondent who were given the questionnaire

Valid	Frequency	Valid Percent
Bachelor	63	31.0
Master	107	52.7
Doctorate.	33	16.3
Total	203	100.0

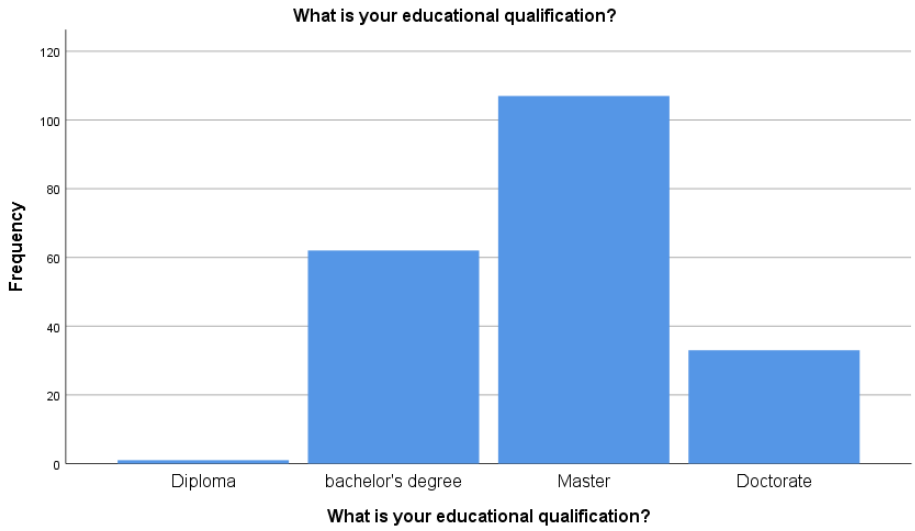

Figure 2. **:** Educational Degrees of Respondents.

Organization Information

Name of the Organization: The questionnaire was distributed across various departments and Offices within Herat University, and its respective frequencies are outlined below.

Table 6. Department/Organization Distribution of Respondents.

Valid	Dentistry	1	.5	.5	.5
	Journalism	4	2.0	2.0	2.5
	Literature	1	.5	.5	3.0
	Public Administration	4	2.0	2.0	4.9
	Science	2	1.0	1.0	5.9
	Veterinary	1	.5	.5	6.4
	Agriculture	6	3.0	3.0	9.4
	Applied Science	3	1.5	1.5	10.8
	Computer Science	16	7.9	7.9	18.7
	Dentistry	9	4.4	4.4	23.2
	Deputy for students	2	1.0	1.0	24.1
	Economics	22	10.8	10.8	35.0
	Education	6	3.0	3.0	37.9
	Engineering	11	5.4	5.4	43.3
	Financial Deputy	14	6.9	6.9	50.2
	Fine Arts	1	.5	.5	50.7
	FineArts	12	5.9	5.9	56.7
	Humanities	6	3.0	3.0	59.6
	Islamic Studies	6	3.0	3.0	62.6
	Journalism	1	.5	.5	63.1
	Law	14	6.9	6.9	70.0
	Literature	13	6.4	6.4	76.4
	Medicine	4	2.0	2.0	78.3
	Public Administration	8	3.9	3.9	82.3
	Science	3	1.5	1.5	83.7
	Scientific Deputy	6	3.0	3.0	86.7
	Social Sciences	9	4.4	4.4	91.1
	V-presidency for research	13	6.4	6.4	97.5
	Veterinary	5	2.5	2.5	100.0
	Total	203	100.0	100.0	

Usig digital systems: Data indicates that 6 to 10 years is the most common duration that respondents have been using digital systems.

Table 7. Duration of Using Digital Systems by Respondents.

How long have you been using digital systems?

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	1 to 5	33	16.3	16.3	16.3
	6 to 10	122	60.1	60.1	76.4
	Above 10	48	23.6	23.6	100.0
	Total	203	100.0	100.0	

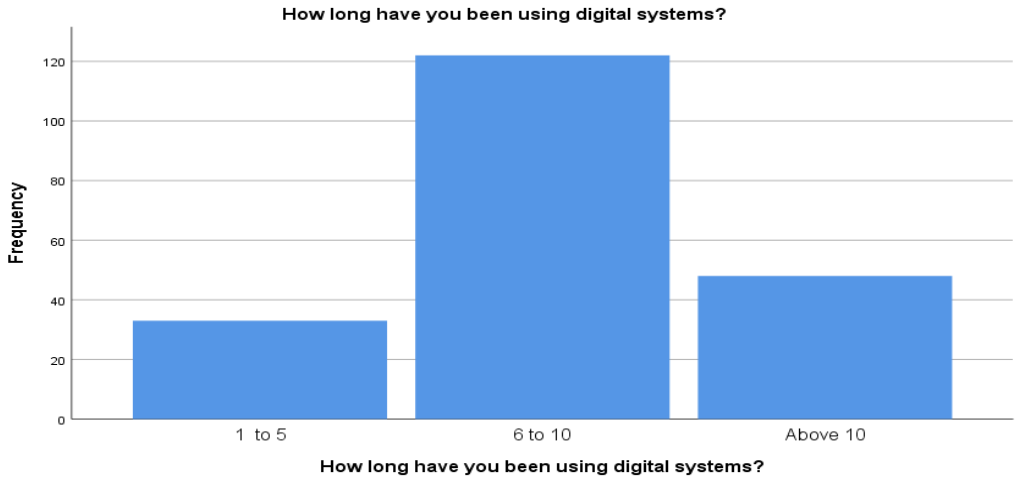

Figure 3. : Duration of Using Digital Systems.

The survey found that 60.1% of organizations have been using digital systems for six to ten years, 23.6% for more than 10 years, and only 16.3% of respondents have been using digital systems for one to five years.

Number of computer users: Most professors and employees in Herat University have reported that between one and five people in their office use computers that shown in the below table and bar chart.

Table 8. Duration of Using Digital Systems by Respondents.

How many staff members in your department use computers?				
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
1 to 5	108	53.2	53.2	53.2
6 to 10	73	36.0	36.0	89.2
Above10	22	10.8	10.8	100.0
Total	203	100.0	100.0	

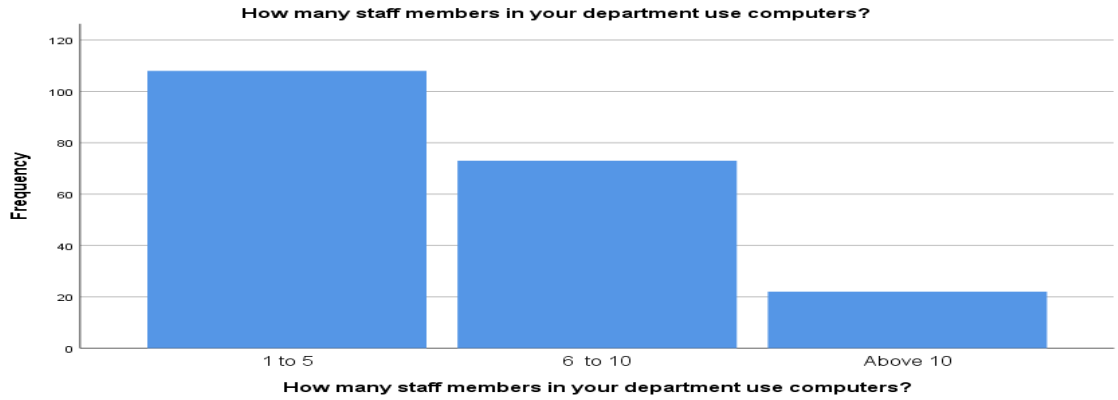

Figure 4 : Number of Computer Users in Departments.

Section 2: Digital Literacy (Familiarity with Digitalization in Educational Environment, Q9–Q14)

Table 9. Descriptive Statistics of Digital Literacy Items (Q9–Q14).

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
How familiar are you with digital systems?	203	1	4	1.55	.778
what extent do you use digital tools in your own education?	203	1	5	1.62	.770
Have you received formal training in the use of digital technology at university?	203	1	5	2.78	1.041
How necessary is digital technology in your workplace?	203	1	4	1.89	.737
How much do you use online educational resources (PDFs, videos, etc.)?	203	1	4	2.11	.880
How accessible are digital tools in your department?	203	1	5	2.40	1.007
Valid N (listwise)	203				

The findings show that familiarity with digital systems and the use of digital tools among staff and students at Herat University remain low. Although some formal training has been provided, it has not been consistent or comprehensive. Despite recognizing the importance of digital technologies, limited access to tools and insufficient training continue to hinder effective digital adoption.

Frequency Distribution of Responses

The very high option has the highest percentage, 60.6 percent, and the low option is 2.5 percent. This indicates that respondents are very familiar with digital systems.

Table 10. Frequency Distribution of Digital Literacy – Familiarity with Digital Systems (Q9).

How familiar are you with digital systems?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Very High	123	60.6	60.6	60.6
	High	54	26.6	26.6	87.2
	Moderate	21	10.3	10.3	97.5
	Low	5	2.5	2.5	100.0
	Total	203	100.0	100.0	

The option "very much" has the highest percentage, 52.7 percent, and the option "very little" has 0.5 percent. This indicates that respondents use digital systems very much.

Table 11. Frequency Distribution of Digital Literacy – Use of Digital Tools (Q10).

what extent do you use digital tools in your own education?

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Very High	107	52.7	52.7	52.7
	High	71	35.0	35.0	87.7
	Moderate	21	10.3	10.3	98.0
	Low	3	1.5	1.5	99.5
	Very Low	1	.5	.5	100.0
	Total	203	100.0	100.0	

The average option has the highest percentage, 37.4 percent. This indicates that respondents have received a moderate amount of formal training in digital systems at university.

Table 12. Frequency Distribution of Digital Literacy – Formal Training (Q11).

Have you received formal training in the use of digital technology at university?

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Very High	25	12.3	12.3	12.3
	High	53	26.1	26.1	38.4
	Moderate	76	37.4	37.4	75.9
	Low	40	19.7	19.7	95.6
	Very Low	9	4.4	4.4	100.0
	Total	203	100.0	100.0	

The option “high” has the highest percentage, 49.3%, and the option “low” has 1.5%. This shows that respondents need digital systems to a great extent in their workplace.

Table 13. Frequency Distribution of Digital Literacy – Necessity of Digital Technology (Q12)

How necessary is digital technology in your workplace?

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Very High	64	31.5	31.5	31.5
	High	100	49.3	49.3	80.8
	Moderate	36	17.7	17.7	98.5
	Low	3	1.5	1.5	100.0
	Total	203	100.0	100.0	

The option “high” has the highest percentage, 37.9%, and the option “low” has 5.4%. This indicates that respondents use digital resources to a large extent.

Table 14. Frequency Distribution of Digital Literacy – Use of Online Resources (Q13).

How much do you use online educational resources (PDFs, videos, etc.)?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Very High	57	28.1	28.1	28.1
	High	77	37.9	37.9	66.0
	Moderate	58	28.6	28.6	94.6
	Low	11	5.4	5.4	100.0
	Total	203	100.0	100.0	

The option "high" has the highest percentage, 34.5%, and the option "very low" has 2.0%. This indicates that digital tools are largely available in the respondents' workplace.

Table 15. Frequency Distribution of Digital Literacy – Accessibility of Digital Tools (Q14).

How accessible are digital tools in your department?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Very High	42	20.7	20.7	20.7
	High	70	34.5	34.5	55.2
	Moderate	63	31.0	31.0	86.2
	Low	24	11.8	11.8	98.0
	Very Low	4	2.0	2.0	100.0
	Total	203	100.0	100.0	

Composite Score of Digital Literacy (he composite scores provide an overall measure of respondents' perceptions**).**

Table 16. Composite Score of Digital Literacy.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Digital_Literacy	203	6.00	24.00	12.3498	3.24279
Valid N (listwise)	203				

A composite variable labeled Digital_Literacy was computed by averaging items Q9–Q14. The mean score was 12.3498, with a standard deviation of 3.24279, reflecting the overall digital literacy level of respondents.

Summary of section

Overall, the findings of Section 4.3 indicate that while respondents at Herat University demonstrate a relatively high familiarity with digital systems and frequent use of digital tools in their academic activities, there remain notable gaps in formal training and accessibility of resources. This suggests that digital literacy is developing but not yet comprehensive across departments. These results are consistent with previous research that highlights the role of continuous training and equal access to tools in strengthening digital competence in higher education (Khan et al., 2021; Alhumaid, 2019).

Quality Impact of Digitalization on Education (Q15–Q20)

Table 17. Descriptive Statistics of Quality Impact Items (Q15–Q20).

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Digital systems have improved teaching methods.	203	1	3	1.33	.504
Digital systems have improved student access to resources.	203	1	4	1.57	.644
Digital systems have enhanced learning effectiveness.	203	1	4	1.61	.677
Online assessment is more accurate than the traditional method.	203	1	4	2.26	.926
Digital systems improved teacher-student interaction.	203	1	4	1.88	.717
Digitalization has increased academic quality of the university.	202	1	4	1.79	.710
Valid N (listwise)	203				

The findings reveal that digital systems have considerably improved teaching methods, student access to resources, learning effectiveness, and teacher-student interaction, while also contributing to the overall academic quality of the university. However, perceptions regarding the accuracy of online assessment compared to traditional methods remain mixed, indicating an area that requires further improvement.

Frequency Distribution of Responses

The option "strongly agree" has the highest percentage, 68%. This shows that digitalization has improved the teaching method.

Table 18. Frequency Distribution – Digital Systems Improved Teaching Methods (Q15).

Digital systems have improved teaching methods.					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	138	68.0	68.0	68.0
	Agree	62	30.5	30.5	98.5
	Neutral	3	1.5	1.5	100.0
	Total	203	100.0	100.0	

The option "strongly agree" has the highest percentage, 50.7%. This indicates that students' access to digital academic resources has increased.

Table 19. Frequency Distribution – Digital Systems Improved Student Access (Q16).

Digital systems have improved student access to resources.

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	103	50.7	50.7	50.7
Agree	87	42.9	42.9	93.6
Neutral	11	5.4	5.4	99.0
Disagree	2	1.0	1.0	100.0
Total	203	100.0	100.0	

The option "strongly agree" has the highest percentage, 48.8%. This shows that the use of digital systems has led to effective learning.

Table 20. Frequency Distribution – Digital Systems Enhanced Learning Effectiveness (Q17).

Digital systems have enhanced learning effectiveness.

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	99	48.8	48.8	48.8
Agree	88	43.3	43.3	92.1
Neutral	13	6.4	6.4	98.5
Disagree	3	1.5	1.5	100.0
Total	203	100.0	100.0	

In question Q18, 33% agreed, 24% completely agreed.

Table 21. Frequency Distribution – Online Assessment Accuracy (Q18).

Online assessment is more accurate than the traditional method.

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	50	24.6	24.6	24.6
Agree	67	33.0	33.0	57.6
Neutral	69	34.0	34.0	91.6
Disagree	17	8.4	8.4	100.0
Total	203	100.0	100.0	

The "agree" option has the highest percentage, 53.2%, and the "strongly agree" option has the highest percentage, 30.5%. This shows that digital systems have increased teacher-student interaction.

Table 22. Frequency Distribution – Teacher-Student Interaction (Q19).

Digital systems improved teacher-student interaction.

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	62	30.5	30.5	30.5

	Agree	108	53.2	53.2	83.7
	Neutral	29	14.3	14.3	98.0
	Disagree	4	2.0	2.0	100.0
	Total	203	100.0	100.0	

The "agree" option has the highest percentage, 48.3%, and the "strongly agree" option has the highest percentage, 36.5%. This shows that digital systems have improved the academic level of the university**.** In question q20, the "agree" option has the highest percentage, 48.3%, and the "strongly agree" option has the highest percentage, 36.5%. This shows that digital systems have improved the academic level of the university**.**

Table 23. Frequency Distribution – Academic Quality Improvement (Q20).

Digitalization has increased academic quality of the university.

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	74	36.5	36.6	36.6
	Agree	98	48.3	48.5	85.1
	Neutral	28	13.8	13.9	99.0
	Disagree	2	1.0	1.0	100.0
	Total	203	99.5	100.0	
Total		203	100.0		

Composite Score of Quality Impact (he composite scores provide an overall measure of respondents' perceptions**).**

The composite variable Quality_Impact was created by averaging Q15–Q20. The mean score was 10.4307, with a standard deviation of 2.50326, suggesting an overall positive perception of digitalization's effect on education quality.

Table 24. Composite Score of Quality Impact.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Quality_Impact	203	6.00	16.00	10.4307	2.50326
Valid N (listwise)	203				

Overall, the findings indicate that digitalization has had a positive and relatively significant impact on the quality of the university. However, the variation in responses suggests that this impact has not been perceived uniformly across all participants.

The results from Section 4.4 reveal that digitalization has significantly improved teaching methods, student access to resources, learning effectiveness, and teacher-student interaction at Herat University. However, the findings also show mixed opinions regarding the reliability of online assessments compared to traditional methods, suggesting that further development is needed in assessment systems. These findings align with international studies, which argue that digitalization enhances educational quality but requires robust evaluation mechanisms (Youssef & Dahmani, 2019; Sangrà & González-Sanmamed, 2016).

Section 4: Challenges and Limitations of Digitalization (Q21–Q26).

Table 25. Descriptive Statistics of Digitalization Challenges (Q21–Q26).

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Lack of training and education in digital systems is one of the major challenges in their implementation.	203	1	4	1.55	.683
Limited or unreliable internet access is a significant barrier to effective digitalization.	203	1	4	1.63	.587
Some staff members are not familiar with how to use digital systems, which negatively affects performance.	203	1	4	1.93	.764
There is no strong and reliable digital infrastructure at Herat University.	203	1	4	2.22	.886
There is a lack of necessary digital tools and appropriate software in the university.	203	1	5	2.33	.924
Resistance to change from some staff is a major challenge in implementing digital systems.	203	1	5	2.23	1.116
Valid N (listwise)	203				

The findings indicate that the most critical challenges to digitalization at Herat University are the lack of training and digital skills and limited or unreliable internet **access**. Additional obstacles include staff unfamiliarity with digital systems, weak infrastructure, insufficient tools and software, and resistance to change. While issues such as internet access and training are broadly agreed upon, perceptions about resistance to change vary considerably. Overall, the results suggest that insufficient skills and inadequate infrastructure are the primary barriers to the effective implementation of digital systems at the university.

Frequency Distribution of Responses

The option “I strongly agree” with 52.7% and the option “I agree” with 42.2% have the highest percentage. This shows that the lack of adequate training is a fundamental problem in the field of digitalization at Herat University.

Table 26. Frequency Distribution – Lack of Training (Q21).

Lack of training and education in digital systems is one of the major challenges in their implementation.

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	107	52.7	52.7	52.7
Agree	86	42.4	42.4	95.1
Neutral	4	2.0	2.0	97.0
Disagree	6	3.0	3.0	100.0
Total	203	100.0	100.0	

The option "I agree" with 54.7% and the option "I strongly agree" with 41.9% have the highest percentage. This shows that the poor quality of the internet is a major obstacle in the field of digitalization at Herat University.

Table 27. Frequency Distribution – Limited Internet Access (Q22).

Limited or unreliable internet access is a significant barrier to effective digitalization.

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	85	41.9	41.9	41.9
Agree	111	54.7	54.7	96.6
Neutral	5	2.5	2.5	99.0
Disagree	2	1.0	1.0	100.0
Total	203	100.0	100.0	

The option "I agree" with(53.2%)and the option "I strongly agree" with 29.1% have the highest percentages. This shows that some employees' lack of familiarity with digital systems is hindering progress.

Table 28. Frequency Distribution – Staff Unfamiliarity (Q23).

Some staff members are not familiar with how to use digital systems, which negatively affects performance.

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	59	29.1	29.1	29.1
Agree	108	53.2	53.2	82.3
Neutral	28	13.8	13.8	96.1
Disagree	8	3.9	3.9	100.0
Total	203	100.0	100.0	

The frequency analysis shows that a majority of respondents (60.6%) agreed or strongly agreed that Herat University lacks strong and reliable digital infrastructure. About one-third of participants (33.0%) expressed neutrality, while only a small minority (6.4%) disagreed with the statement. These results suggest that the weakness of digital infrastructure is widely perceived as one of the fundamental challenges hindering the process of digitalization at the university.

Table 29. Frequency Distribution – Weak Digital Infrastructure (Q24).

There is no strong and reliable digital infrastructure at Herat University.

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	49	24.1	24.1	24.1
	Agree	74	36.5	36.5	60.6
	Neutral	67	33.0	33.0	93.6
	Disagree	13	6.4	6.4	100.0
	Total	203	100.0	100.0	

A large percentage of respondents believe that some systems do not have the necessary support.

Table 30. Frequency Distribution – Lack of Digital Tools/Software (Q25).

There is a lack of necessary digital tools and appropriate software in the university.

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	41	20.2	20.2	20.2
	Agree	76	37.4	37.4	57.6
	Neutral	67	33.0	33.0	90.6
	Disagree	17	8.4	8.4	99.0
	Strongly Disagree	2	1.0	1.0	100.0
	Total	203	100.0	100.0	

A large percentage of respondents believe that resistance to digital change is a major problem.

Table 31. Frequency Distribution – Resistance to Change (Q26).

Resistance to change from some staff is a major challenge in implementing digital systems.

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	61	30.0	30.0	30.0
	Agree	78	38.4	38.4	68.5
	Neutral	25	12.3	12.3	80.8
	Disagree	35	17.2	17.2	98.0
	Strongly Disagree	4	2.0	2.0	100.0
	Total	203	100.0	100.0	

Composite Score of Challenges(he composite scores provide an overall measure of respondents' perceptions).

The composite variable Challenges was computed by averaging Q21–Q26. The mean score was 11.8719, with a standard deviation of 2.87243, reflecting the overall perception of barriers to digitalization

Table 32. Composite Score of Challenges.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Challenges	203	6.00	18.00	11.8719	2.87243
Valid N (listwise)	203				

Most respondents believe that there are many challenges in the field of digitalization.

Summary of section

Section 4.5 highlights that the most pressing challenges for digitalization at Herat University include insufficient training, limited internet reliability, lack of digital infrastructure, and resistance to change among staff. These obstacles suggest that although digital systems are being adopted, their full potential is constrained by infrastructural and cultural barriers. This observation is supported by similar studies in developing countries, which emphasize that digital transformation in higher education often struggles due to weak infrastructure and limited digital competencies (Nguyen et al., 2021; Trucano, 2020).

Section 5: Role of Digital Systems in University Administration (Q27–Q30).

Table 33. Descriptive Statistics of Role of Digital Systems in Administration (Q27–Q30).

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Using digital systems in administrative departments increases accuracy and prevents mistakes	203	1	3	1.36	.522
Accessing administrative and academic information becomes easier through digital systems.	202	1	3	1.44	.572
Digital systems reduce paperwork and prevent administrative bureaucracy.	203	1	5	1.90	.870
Employee performance evaluation and management improved with digital tools.	203	1	3	1.70	.692
Challenges	203	6.00	18.00	11.8719	2.87243
Valid N (listwise)	202				

Administrative departments at Herat University, particularly in terms of accuracy, efficiency, and accessibility of information. It has also contributed to reducing bureaucracy and enhancing employee management. Nevertheless, the presence of moderate to high challenges highlights that, despite these advantages, substantial barriers remain in the path of fully effective digital implementation.

Frequency Distribution of Responses

Most respondents believe that digital systems have increased the accuracy of administrative tasks.

Table 34. Frequency Distribution – Accuracy and Prevention of Mistakes (Q27).

Using digital systems in administrative departments increases accuracy and prevents mistakes

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	133	65.5	65.5	65.5
	Agree	66	32.5	32.5	98.0
	Neutral	4	2.0	2.0	100.0
	Total	203	100.0	100.0	

60.1% of respondents strongly agreed and 36% agreed that access to information has become simpler and more confidential.

Table 35. Frequency Distribution – Easier Access to Information (Q28).

Accessing administrative and academic information becomes easier through digital systems.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	122	60.1	60.1	60.1
	Agree	73	36.0	36.0	96.1
	Neutral	8	3.9	3.9	100.0
	Total	203	100.0	100.0	

39.4% of respondents strongly agreed and 35% agreed that digital systems have reduced the use of paper.

Table 36. Frequency Distribution – Reduction of Paperwork (Q29).

Digital systems reduce paperwork and prevent administrative bureaucracy.

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	80	39.4	39.4	39.4
	Agree	71	35.0	35.0	74.4
	Neutral	46	22.7	22.7	97.0
	Disagree	5	2.5	2.5	99.5
	Strongly Disagree	1	.5	.5	100.0
	Total	203	100.0	100.0	

43.3 percent of respondents strongly agreed and 43.3 percent agreed.

Table 37. Frequency Distribution – Employee Performance Evaluation (Q30).

Employee performance evaluation and management improved with digital tools.

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	88	43.3	43.3	43.3
	Agree	88	43.3	43.3	86.7
	Neutral	27	13.3	13.3	100.0
	Total	203	100.0	100.0	

4.6.4 Composite Score of Admin Systems (he composite scores provide an overall measure of respondents' perceptions**).**

Table 38. Composite Score of Administrative Systems.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Admin_Systems	203	4.00	14.00	6.3990	1.93032
Valid N (listwise)	203				

Respondents' perspectives on the university's administrative systems are generally moderate, with a mean score of 6.40. The relatively low standard deviation of 1.93 indicates that there is not much variation in opinions, reflecting a general consensus among respondents. Overall, the administrative systems are perceived as acceptable but may require improvements in certain areas.

Discussion

This study investigated the impact of digitalization on educational quality at Herat University, highlighting the roles of digital literacy, system support, training, and infrastructure. The findings demonstrated that digital literacy of faculty and administrative staff significantly affects their ability to interact with digital systems effectively, which in turn enhances educational quality and administrative efficiency. Moreover, users valued technical support and training highly, especially given Afghanistan's infrastructural limitations and reliance on human assistance. However, infrastructure challenges, limited internet access, and uneven levels of digital literacy constrained the broader success of digital initiatives.

When compared with previous studies, these findings are largely consistent with regional and international evidence. For instance, Ismailova et al. (2022) showed that in Uzbekistan, access to digital platforms improved course delivery, student communication, and administrative transparency, while digital literacy and infrastructure were identified as critical mediating factors. Similarly, UNESCO (2021) reported that the adoption of Learning Management Systems (LMS), online assessments, and digital libraries enhanced student satisfaction and academic performance, although challenges of infrastructure and resistance to change remained. OECD (2020) also emphasized the need for embedding digital systems across academic and administrative functions, aligning them with quality assurance goals, and prioritizing staff training in digital competencies. These parallels reinforce the relevance of the present study's findings in the Afghan context.

Nationally, the Ministry of Higher Education (MoHE, 2022) acknowledged both progress and persistent limitations in digital transformation. Initiatives such as online registration and grading systems represent important steps, but weak infrastructure, limited technical capacity, and insufficient policy support continue to hinder progress. At Herat University, internal evaluations confirm that platforms like Google Classroom and Moodle are being adopted, but unevenly across faculties. Some departments actively integrate digital tools, while others remain reliant on traditional teaching and administrative practices, echoing the global pattern of uneven digital adoption (UNESCO, 2021; OECD, 2020).

The findings of this study contribute both theoretical and practical implications. Theoretically, the results underscore the significance of digital literacy and institutional support as core elements in models of information system success, especially in developing country contexts. Practically, university management should prioritize targeted training, robust technical support, and responsive service mechanisms to enhance user satisfaction and system uptake. These strategies not only improve digital system effectiveness but also foster broader institutional alignment with quality assurance frameworks. Furthermore, the insights derived from this study may inform digitalization strategies in other Afghan higher education institutions, many of which face similar infrastructural and organizational challenges.

Future research should explore longitudinal analyses to assess the sustainability of digital adoption over time and across different faculties, as well as comparative studies across Afghan universities to evaluate systemic strengths and weaknesses. Investigations into policy frameworks, resource allocation, and the integration of digital systems with broader educational reforms would also deepen understanding of digitalization in fragile contexts.

Conclusion

This study concludes that digitalization at Herat University has a positive impact on both educational quality and administrative efficiency. The results highlight that digital literacy and effective system use are essential for success, while technical support and continuous training play a decisive role in ensuring user satisfaction and system adoption. At the same time, infrastructural and resource limitations remain critical challenges that restrict the full realization of digital transformation. Overall, the findings suggest that successful digitalization is not solely dependent on technology but equally shaped by human factors such as training, literacy, and institutional responsiveness. By addressing these dimensions, universities in Afghanistan and similar developing country contexts can strengthen their capacity to integrate digital systems effectively. These results provide valuable guidance for policymakers and university managers, underlining the importance of investing in both technological infrastructure and human capital to achieve sustainable improvements in higher education quality.

Acknowledgment

The authors also thank the anonymous reviewers for their helpful comments and suggestions.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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