

Digitization in the Higher Education Sector: Requirements and Challenges

1^{er} Saida Bouzourane¹, 2^{ème} Houria Zeguendri²

¹ University: Dr. Yahia Farès University – Médéa – Rank: Lecturer B –, Email: drbouzouranyasser@gmail.com,

² University: Djilali Bounaama University – Khemis Miliana – Rank: Lecturer B –,
Email: h.zeguendri@univ-dbkm.dz

Received:02./12/2025

Accepted: 13./01/2026

Published:26./01/2026

[illegible]

Abstract:

The Algerian university is one of the important institutions that has sought to implement the digitization project within the strategies approved by the Ministry of Higher Education and Scientific Research. It primarily relies on the use of modern technological means to provide quality education. The technological services are represented in the "Progress" system and the university platforms "Moodle" to adopt a modern model of university governance at the level of higher education and scientific research institutions on one hand, and at the level of pedagogical performance on the other.

Keywords: Digitization; Higher; Education Institutions; University Governance.

1. Introduction :

New challenges are being raised today by the Algerian university through its adoption of digitalization and the integration of numerous reforms aimed at modernizing structures and specializations, improving services, and raising the quality of education.

The goal is to make the university the main driver of a knowledge-based economy that aligns with the strong will guiding the new Algeria.

The government's experience in digitalizing and modernizing the higher education system has recorded a qualitative leap and an advanced rate of implementation on the ground, according to experts. This was manifested in its generalization and launch in Algerian universities by providing students with modern technologies that enable them to use information and communication technologies (ICT) to develop their learning and increase their academic achievement.

The entry of the digital transformation into its second phase across all strategic sectors has been reflected in the widespread use of ICT, especially in Algerian universities. This challenge was met by the government with the start of the new academic year, which reduced the digital divide that prevailed in the past and placed the higher education sector on the path of development, making it a driver of economic growth in Algeria.

The sector has focused on improving university services and digitalizing all administrative procedures through the development of an information system ("Barwaghars" and "Moodle") that allows interaction between professors and students and the provision of remote lessons, which now offer services in both Arabic and English. Additionally, the activation of student attendance tracking through this

system has been implemented by generalizing the use of the unified, multi-purpose student card.

The introduction of these digital platforms within Algerian universities and their use in all administrative and educational transactions is a step that will strengthen the digital transformation toward achieving the project of a digital university.

2. Defining Concepts:

2.1. Concept of Digitization:

An administrative strategy for modernizing information, aimed at providing better services to citizens and institutions, while optimally utilizing available information resources through the employment of available material, human, and intangible resources within a modern electronic framework to make the best use of time and effort and to achieve targeted demands with the required quality (Ben Yamina & Zadi, 2019, p. 70).

2.2. Digitization in the Higher Education Sector:

Refers to all information and communication technologies used in higher education for the purpose of storing, processing, retrieving, and transferring information from one place to another. This contributes to the development and enhancement of the educational process using all modern means such as computers and their software, Internet technologies like e-books, databases, encyclopedias, educational websites, email, and distance learning (Abdel-Baqi, 2007, p. 6).

▪ Operational Concept:

This refers to abandoning traditional methods in performing tasks assigned to professors or administrators and adopting more modern approaches, relying on advanced communication and information technology. The purpose is to facilitate interaction and ease the educational and pedagogical process for the student.

2.3.Governance:

A new term synonymous with globalization and computerization, it means unifying management, policies, and procedures, including decision-making (Negropointe, 1995, p. 4).

It is a policy whereby an institution is subjected to a set of laws and decisions aimed at achieving quality and excellence in performance by selecting appropriate and more effective methods to achieve the institution's goals and controlling the relationships among the parties influencing performance.

2.4.University Governance:

Refers to bringing in models, principles, and systems of excellence and superiority that govern the performance of the university institution, to ensure the validity and soundness of directions and behaviors. It involves active participation from all stakeholders and prioritizing the public interest over individual interest, which leads to the development of the institution and the protection of the interests of all parties involved"(Khamis, 2013, p. 25)

▪ Operational Concept:

This means the university adopts modern systems and methods of management aimed at regulating and directing work and activities and organizing relationships, contributing to achieving the interests of all active parties within the university institution.

2.5.Dimensions of Digitization:

There are four dimensions of digitization, summarized as follows:

▪ Strategic Planning:

This involves understanding the purpose behind the institution's adoption of the digitization path, and setting possibilities to provide a

workflow and achieve the institution's vision and goals, taking into account the final outcomes. It includes the mission statement, institutional values, strategic objectives, and the programs and activities that must be accomplished to achieve these objectives in line with modern technological developments, as well as the distribution of responsibilities for implementing these activities.

- **Preparing Leaders in the Field of Digitization:**

This involves the institution's efforts to develop the capabilities of those responsible for digitization by providing training and education in this area, enabling them to fully understand all aspects of the process and enhancing their knowledge to successfully manage the operation.

- **The Organizational Environment for Digitization:**

This relates to the extent to which the institution implements the digitization project, including the allocation of an organizational unit dedicated to this process and ensuring coordination among various departments and units within the institution.

- **Attracting Human Skills for the Digitization Process:**

This depends on the institution's strategy for attracting and recruiting qualified human resources capable of managing and successfully executing the digitization process (Mufrej et al., 2022, pp. 1215–1216).

3. National Digital Transformation Plan for Higher Education in Algeria:

Algeria has developed a strategy aimed at successfully implementing digital transformation in universities by:

- Integrating and utilizing modern digital technologies within the teaching context.

- Raising awareness among various university stakeholders (professors, students, administrative staff) about the effectiveness of

information and communication technologies (ICT) in achieving higher efficiency in teaching and research output.

- Ensuring the provision of all necessary equipment and establishing continuous information and communication technology networks.
- Enhancing and qualifying human capacities.
- Benefiting from leading international expertise in the field of digital transformation(Boutaba, 2021, p. 44).

4. Efforts of Algerian Universities to Initiate a Digital Revolution for Governance Modernization and Strengthening Scientific Research:

Digital transformation is one of the most prominent terms in the current technological era, and the higher education sector is among the key sectors striving to realize the digitization project. This is in line with state strategies based on the use of modern technological tools and methods to provide quality education that keeps pace with contemporary developments.

This digital culture to be established represents the implementation of the main digitization plan, which includes fundamental axes covering all fields within the university environment. Each axis contains a set of strategic programs, which in turn include operational projects that the Ministry aims to implement through university institutions.

Through these initiatives, a digital culture will be established to facilitate work and services among university staff, including administrative personnel, professors, and students.

Through the policy implemented by the ministry, a digital library space has been established, enabling students to access the library and select titles directly from their homes without needing to visit the central library. Additionally, digital repositories have been created to allow students to access articles published by professors.

One of the most prominent forms of e-learning is the Moodle platform, where professors provide educational content to students, monitor their progress, and offer technological services represented by the Progress system. Moodle is one of the largest platforms through which all pedagogical and administrative operations are managed, including the discussion of doctoral theses. Moreover, several intelligent systems have influenced administration and its processes, as well as students' mindset and reception of information, shifting from traditional to digital formats.

The goal of this platform is to track the student's journey from their first day at the university until graduation.

Examples of these platforms include:

- A platform dedicated to managing internships of various types.
- A platform for handling grievances, including correspondence management.
- A platform for certifying diplomas and managing transfers between universities.
- A newly introduced platform specifically for baccalaureate students called "Ask Me," which allows new students to submit their questions and concerns while awaiting responses from specialists.
- A platform dedicated to university services such as accommodation, to facilitate various procedures within the campus.
- Another platform specifically for doctoral students to monitor their academic training.

All these platforms contribute to facilitating and enhancing the digitization project within Algerian universities.

Today, Algerian universities are focusing on developing their start-up institutions through creativity and innovation in the fields of technology and artificial intelligence by providing opportunities for these institutions to establish a unique database aimed at creating an interactive economic market to enhance innovation and disseminate

technology, with the goal of making today's student the entrepreneur of tomorrow.

The sector has dedicated a strategy oriented towards innovation, establishing start-ups, and encouraging students to utilize all aspects related to digitalization, whether from the pedagogical side, scientific research, or even in valorizing their outputs in the form of start-ups or subsidiary companies. From this perspective, the Ministry introduced what is known as Ministerial Decision (12-75), which includes the Start-up Certificate and the Patent Certificate. This decision began to be implemented starting October 2022.

An important strategy was outlined for its implementation on the ground across 114 higher education institutions.

With the large and increasing number of students currently attending Algerian universities, there is an urgent need to find alternative forms of education, represented by distance learning according to Executive Decree 22-08 dated June 5, 2022.

5. Requirements for Digitalization in the Higher Education Sector:

There are several requirements summarized as follows:

5.1. Technical Requirements:

It is necessary to provide a wired and wireless communication network covering all university facilities, ensuring high-speed internet flow to facilitate the process.

- **Data and Information Security:** The data of professors and students must be secured to avoid theft and hacking as much as possible.
- Ensuring the availability of digital libraries to support scientific research for both professors and students.

- Procuring modern devices and equipment such as computers, display screens, and surveillance cameras.
- Providing academic learning platforms such as Moodle to facilitate interaction between professors and students.
- Implementing the "IMIS" system, which integrates all university systems and processes into a single framework, from data collection, organization, and retrieval, so they operate as a unified unit.

5.2.Human Requirements:

- Digitization requires human resources capable of efficiently and effectively using and managing digital tools to facilitate interaction with students through digital platforms.
- Equipping students with essential digital skills necessary for effectively handling and communicating with digital data online.
- Providing the university with IT experts and specialists for maintenance and user support.
- Enhancing and spreading digital transformation skills among all university members, including students, staff, professors, and administrators.

5.3.Administrative and Organizational Requirements:

Primarily include:

- Developing a strategic plan to achieve digital transformation that serves the established goals, alongside leadership playing a crucial role in supporting and encouraging digital initiatives.
- Finding appropriate methods to adapt to this new model in order to manage and address resistance to change resulting from digitization as a new approach.
- Improving and developing academic programs to align with digitization by using technology in teaching and student assessment to facilitate interaction between professors and students.
- Establishing clear policies for optimal technology use and facilitating e-learning while ensuring data protection against hacking.

- Allocating a sufficient budget to cover the costs and requirements of digitization, including human resources and technological equipment.
- Conducting periodic evaluations and reviews to identify shortcomings and assess the effectiveness of digital transformation on university performance.

5.4.Social and Economic Requirements:

Digitalization requires raising awareness among all university members about the importance of digital transformation and working to build cooperative relationships and partnerships with external institutions and the surrounding environment to benefit from and exchange expertise. Additionally, it is essential that educational programs align with labor market demands to prevent university graduates from facing the looming threat of unemployment.

5.5.Challenges of Digitalization in Higher Education:

We have addressed the requirements of digitalization; however, there are several challenges facing this new system, which can be summarized into five main challenges:

a) First: Infrastructure Challenges:

- Weak Internet: There is slow internet flow, especially in remote areas, which hinders the smooth progress of the educational process.
- Lack of Equipment and Devices: Particularly technological devices for students who cannot afford computers or smartboards, and for university administration in terms of not regularly updating technological infrastructure.
- Widening Digital Divide: There is a disparity between students who have fast internet access and those who lack it, resulting in unequal educational opportunities.

- **Cybersecurity:** Many institutions lack information protection systems, making them vulnerable to hacking. This necessitates investments to provide preventive systems.

b) Human Resources Challenges:

- **Shortage of Qualified Human Resources:** Digitalization requires knowledge and control of digital tools and technology to prepare, design, develop educational programs, and interact with students across various platforms.

- **Resistance to Digitalization:** Some university members—students, administrative staff, or professors—may resist digitalization, preferring traditional working methods.

- **Working on developing students' abilities** so that they can optimally control technology through educational training courses and interaction with various digital platforms.

c) Challenges of Educational Content:

- **Converting traditional content to digital:** This means restructuring the educational material from any traditional form to be compatible with all digital formats.

- **Developing engaging interactive content:** Moving away from traditional methods such as lectures and lessons, and relying on interactive electronic media like the Moodle platform.

- **Updating curricula to keep pace with developments:** Curricula must be adaptable to new technologies and aligned with labor market requirements.

- **Ensuring the quality of digital education:** The outcomes of the new education must achieve the desired results to guarantee that students receive a better learning experience than relying on traditional methods.

d) Challenges of Assessment and Accreditation:

Questions arise regarding accreditation and assessment, where:

Clear assessment methods should be relied upon, cheating minimized, and the identity of examinees verified.

Digital certificates must also be recognized and accepted in the labor market to prevent university graduates from facing employment difficulties.

e) Challenges of Funding and Sustainability:

Digitization requires significant funding and investments, especially concerning the purchase of devices, equipment, software, internet networks, their maintenance, as well as hiring experts and specialists in the field of technology. This is essential to ensure the continuity and success of the process.

6. Conclusion:

The project to establish digital platforms at the higher education and scientific research levels aims to add value for university students by enhancing their interaction with various content provided by Algerian universities. This fosters a culture of interactive communication that brings students closer to the diverse activities of the university and to the concept of new academic achievement that can be introduced throughout their educational journey.

Integrating technology into the university environment contributes to multiple facilitative measures to achieve quality education that keeps pace with ongoing developments. However, we cannot overlook the range of requirements and obstacles, whether financial or human-related, that hinder the progress of the digitization project.

Based on the above: We conclude that it is necessary to:

- Prepare and conduct training courses for professors and administrative staff on digitization applications and methodologies.

- It is essential to establish a set of systematic plans and strategies at the national level and within ministries and agencies leading the digitization project.
- The scope of studies and research addressing the application of digitization in the educational process and its impact on scientific research should be expanded and deepened.
- Special emphasis should be placed on digitizing libraries by equipping them with information and communication technologies, as they serve as a platform for various scientific research activities.

7. references :

- Ben Yamina, K., & Zadi, D. N. A. (2019, May). *The role of digitalization and e-management in enhancing human resource management*. Journal of Distance and Open Education, 7(12), 70.
- Abdel-Baqi, A.-M. (2007). *Obstacles to employing information and communication technology in commercial subject curricula in secondary education*. In *Proceedings of the International Conference on the Use of Information and Communication Technology to Develop Pre-University Education* (p. 6). Egypt.
- Negropointe, N. (1995). *Being digital*. Alfred A. Knopf.
- Khamis, K. (2013, March 28). *Obstacles to implementing governance in higher education institutions in Palestine and ways to overcome them* [Paper presented at the Workshop on Governance of Higher Education Institutions, Islamic University, Gaza]. Retrieved November 27, 2025, from <http://ar.wikipedia.org/wiki>
- Mufrej, T., et al. (2022, March). *The role of human resource management in supporting digitalization*. Scientific Journal of Financial and Administrative Studies and Research, 13, 1215–1216.
- Boutaba, M. (2021). *University professor training as a necessity to achieve digitalization* [Paper presented at the Virtual International Forum on Digitalization, Quality of Higher Education, Scientific Research, and Achieving Sustainable Development, Boumerdes, Faculty of Law and Political Science]. p. 44.