

Digital technologies and their impact on higher education in Algeria

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Hadj mohamed fadila¹

¹ University of Mascara, Algeria,

Email: fadila.hadj_mohamed@univ-mascara.dz

Abstract:

The Algerian state has taken several steps in the field of e-learning, which still requires great capabilities, including the technological environment that allows the success of this type of education, especially in virtual or electronic universities. By focusing on the higher education sector, Algeria, like other countries of the world, seeks to reform its educational system for the purpose of keeping pace with developments. Technology and its sufficiency with the requirements of the times, and e-learning was an important part of the Algerian state's plan, which was imposed by it, especially the epidemiological situation as a result of the spread of the Corona pandemic in February 2020.

Keywords: digital technology; Quality of distance education; Higher education sector; Digital platform; E-Learning.

Corresponding Author: hadjmohamed fadila, **Email:**

fadila.hadj_mohamed@univ-mascara.dz

1. INTRODUCTION

Digital technology has developed at a tremendous speed, surpassing all innovations we have seen in our history. This technology has reached nearly half of the developing world's population in just two decades, radically changing societies. Thanks to enhancing electronic communication, enhancing financial inclusion, and providing access to commercial and public services, technology has a major role to play in promoting equality. For example, in education, online and distance learning environments provide access to educational programs for students who would otherwise be marginalized. In addition, technology facilitates access to services public and enhance transparency through the use of blockchain technologies. Big data also allows for the development of policies and programs that are more responsive and accurate.

□ Research problem: How do digital technologies affect the development of the higher education sector in Algeria?

□ Objectives of the study: Through this study, we seek to achieve some objectives, including knowing the impact of digital technology on higher education in Algeria by clarifying the concept of digital technologies,

□ General objectives of the study:

Digital transformations require significant investment in advanced technological infrastructure and the development of innovative educational methods.

-Developing education curricula to be more compatible with the changing labor market requirements and information technology.

Digital technologies can contribute to expanding access to education and providing educational opportunities for all, including students in remote areas and those with special needs.

Modern technologies provide new opportunities to improve the learning experience and provide interactive and innovative educational content that attracts and encourages students to learn..

□ Study methodology: In order to cover the aspects of the subject of the study, we will use in this research paper the descriptive and analytical method, relying on some quantitative methods in a form through which we seek to answer the problem at hand.

2. Digital technology:

2.1 Concept of digital technology:

We observe significant advances in the field of information technology, ranging from further advances in computer power to the adoption of innovative technologies such as cloud infrastructure and those associated with artificial intelligence and machine learning. The adoption of digital technology forces a significant reduction in costs for organizations across many areas and fosters innovation in production processes. And their business models (f.puccioni.c.ricchi.o, 2023,“p05) Which

enhances the flexibility of the organization's organization and reduces costs. From this standpoint, digital technology is defined as the reduction of specific information about a specific thing, such as images, sound, or text, into binary codes. Digital technology also combines in its entity basic elements, which are computers with their various hardware and applications and software, whether traditional. Including or modern (smart) databases. (zermane, 2020, p164)

The digitization of existing systems is linked to the existence and continuous development of both the Internet of Things and the cyber-physical system. Cloud manufacturing and big data analysis are also considered core technologies. These digital technologies have the potential to serve the goals of the economy by enhancing the efficiency of resource utilization, reducing waste, and increasing collaboration and innovation. To highlight the basic principles of these technologies, the potential advantages that their applications entail are presented in the sections next : (Umair And others, 2023,p03)

Digital technology refers to all electronic technologies with their various tools, automated systems, devices and technological resources that produce, process or store information. It includes any computer-supported programs and technological systems for carrying out a specific task: (<https://www.it-pillars.com>)

- Internet of Things (IoT)

The Internet of Things is considered a modern concept in the manufacturing industry. The Internet of Things (IoT) is considered one of the most widespread technological trends of the 21st century, and there are few areas of our daily lives that have not been affected by the “Internet of Things”. This is where the physical world is connected. and digital communication with each other by exploiting the capabilities of the Internet. The Internet of Things constitutes a digital tool that facilitates the collection, sharing, and use of available data derived from manufacturing processes. The Internet of Things provides real-time information sharing between relevant stakeholders through the use of critical technologies such as Radio Frequency Identification (RFID) tags, sensors, and smartphones. It opens the door to a significant increase in process efficiency.

-Cyber-Physical System (CPS)

The cyber-physical system lies in the interaction between physical objects and the multiple processes that occur within a manufacturing network. In a cyber-physical system, computers, IT systems, embedded systems and humans share a large amount of data to improve processes related to manufacturing and production processes, while providing reliable and efficient communication channels. In this context, the cyber-physical system has the potential to establish these principles by enabling an uninterrupted flow of information

using numerous interactive sensors and devices. Thus, a cyber-physical system can provide automation and integration of all stakeholders, autonomous and data-based decision systems.

-Fastener Manufacturing (CM)

Manufacturing Cloud is a virtual model of manufacturing processes and the processes that follow them. Resources related to manufacturing processes and operations are monitored by contributing to the Internet. The cloud manufacturing model is a virtual representation of the real world and its effective operations require many technologies. In particular, He and Xu stated that “among all technologies, cloud computing and IoT profoundly influence the development of cloud manufacturing.” Cloud computing provides a cloud-based interpretation of available manufacturing resources distributed over a wide geographic scope. Thus, cloud-based collaborative partnerships are formed within the value chain, such as suppliers, manufacturers and buyers, in terms of design, manufacturing and product distribution.

-Big Data Analysis (BDA)

Enabling companies to collect, process and interpret data allows them to achieve significant financial returns. Organizations can use big data analysis to make decisions about how to efficiently exploit the volume and diversity of information. For example, companies can leverage big data

analysis to make accurate decisions about demand for a particular product and improve forecasting techniques. Big data analysis provides multiple business intelligence to companies to simplify complex data structures. Accordingly, companies must hire suitable employees to implement advanced data analysis techniques. (Free, 2009,p107-109).

2.2 Digital technology goals:

Digital technology aims to raise the level of performance and optimal use in all sectors, including many objectives, including the following:

- Accelerate communication with greater accuracy, efficiency and lowest cost;
- Reducing the costs of production complexity and eliminating the effect of competitive advantage resulting from economies of scale;
- Providing accurate and up-to-date information to support decision-making;
- Providing structured processes and simplified procedures for resource management and thus greater effectiveness;
- Bringing the administration closer to the citizen;
- Ease of reducing procedures in all magazines;
- Save time and effort;

- Enhancing accountability and transparency, which leads to reducing errors and fraud. (Prat, 2008 P.237)

3. Digitization of the higher education sector in Algeria:

3.1 Scientific research methods

-Definition of progres website:

This platform is considered an information system that enables comprehensive management of all university affairs. This platform has a set of tasks, including the following:

Registration, guidance and transfer of new students.

- Giving the student an account that follows him throughout his academic career and informs him of all his pedagogical matters.

- Comprehensive preservation of the student's academic path.

- Formulating time distribution programs and work hours for professors.

- Managing the deliberations process.

-Management of foreign certificates

- Tracking the career path of professors and workers.

-Opening the way to send appointments and complaints

The Algerian University is counting on this platform to be a comprehensive information system that provides an integrated data base on students, professors, and workers.

(<https://fll.univguelma.dz/ar/content/%D9%85%D9%86%D8%B>

5%D8%A9-progres#:~:tex)

-Definition of digitization:

Digital transformation is the process of converting data into numbers that an organization applies to integrate digital technology into all areas of business.

Companies are adopting innovative digital technologies to make cultural and operational transformations that better align with changing customer demands. Examples of digital transformation include:

- Companies start creating digital solutions, such as mobile applications or an e-commerce platform.
- Migrating companies from local computer-based infrastructure to cloud computing.
- Companies adopting smart sensors to reduce operating costs (<https://seu.edu.sa>)

-The difference between digitization and digital transformation:

Digitization is the process of transforming physical aspects of business processes and workflows into digital aspects. Examples of this include:

The paper forms that customers fill out are converted into digital forms that they complete online. This digital data can be used for analytics and business intelligence. In business, digitization

initiatives may include projects such as: modernizing legacy systems.

-Automate existing paper or manual processes.

-Move the system to be available online.

Digitization alone does not constitute digital transformation, but it is an important first step in the digital transformation process. Digital transformation has a much broader scope that leads to a dominant cultural shift in the organization. (El-Kassim, 2020, Mai 07)

-The best academic research engines:

We often do not find good results for our academic research on well-known search engines such as Google, Yahoo, and Bing. Although the Google search engine is considered the most powerful search engine in the world, its varying results do not meet the needs of scholars, students, professors, and researchers who wish to complete academic research, and it is among the best academic scientific research engines :

1-Lib Guides Community is a website that provides you with the service of searching and exploring more than 318,968 research guides supervised by more than 53,731 librarians in 3,856 libraries around the world.

2- Academic Info A search guide rich in the best links and resources most closely related to your research topic, by reviewing a list of search results that are often printed references or electronic sources.

3-Archival Research Catalog is the official website of the National Archives and Records Administration in the United States of America, where the documents that this institution preserves and documents can be searched. The site can also be used to search the references provided by some US presidential libraries.

4-BASE is one of the largest search engines in the world, especially for open electronic scientific resources. The site is supervised by the administration of the German University of Bielefeld Library. (<https://dsrs.ksu.edu>)

5-CiteuLike is a free service for managing and discovering scientific references, and it offers approximately 7 million scientific articles.

6- Eric is an online digital library for educational research and information, sponsored by the Institute of Education Sciences (IES) in the US Department of Education. It provides easy access to educational resources to support their use in improving learning and teaching practices, in making educational decisions and in conducting research.

7- Infomine is a virtual library of Internet resources related to faculty members, students, and research staff at the university level. It contains important resources such as databases, electronic journals, e-books, bulletin boards, mailing lists, articles, researcher directories, and other types of information.

8- Infotopia is a search engine for students that provides information and archives sites and topics of art, history, social sciences, and societal issues and problems. (<https://mobt3ath.com>)

9- Google Scholar Google Scholar provides an easy way to search widely in scientific material. You can search across many disciplines and sources: articles, dissertations, books, abstracts and peer-reviewed opinions, from academic publishers, professional societies, online repositories, universities and other sites. Google Scholar helps you collect scientific research work related to your topic all over the world.

10- Library of Congress The Library of Congress provides you with the service of searching primary sources of documents, including photos, maps, manuscripts, historical newspapers, and more. (<https://dsrs.ksu.edu>)

11- Refseek is a search engine intended for students and researchers. It classifies more than a billion articles, including web pages, books, encyclopedias, magazines, and newspapers.

12- The Virtual LRC indexes thousands of the best academic information sites, selected by teachers and library professionals around the world, in order to provide students and teachers with correct information for academic projects for schools and universities.

13- SweetSearch is a website that helps students obtain targeted information quickly, by identifying the most relevant results from a list of credible resources, and makes it easier for them to find primary sources away from unwanted sites and marginal sites that lack academic or journalistic rigor.

14- DeepDyve is a site that allows you to search in thousands of leading scientific journals such as (Springer, Elsevier, Nature, IEEE, Wiley-Blackwell) and others... You can also read their articles without interruption and receive via your e-mail the latest scientific materials on the topic you choose. (<https://dsrs.ksu.edu>)

3.2 Distance education experience:

In this regard, Dr. Belhani Ahmed, Chairman of the National Committee for Distance Education and representative of the Minister of Higher Education, said in a statement to “Algeria Now” that virtual education in Algeria, or what is known as distance education in Algerian university institutions, began about 17 years ago, that is, since the year 2006. Through initiatives by the guardian ministry, by training two components in the field of distance education and how to include distance lessons through a strategy that provided universities with some means that would enable the launch of distance education, but from 2006 until 2016 these initiatives were very minimal. (<http://djoudi.online.fr>)

In the year 2016, the state developed a new program for training professors, and through it, it developed 3 axes regarding the integration of media and communication technologies into university teaching. Then, the guardian ministry trained approximately 10,000 professors((Djabir, 2018 Octobre 14) and until 2022 there were, after the arrival and appointment of Minister Kamal Badari.” At the head of the Ministry of Higher Education, a new method was launched to integrate this type of electronic or distance education, by establishing a committee charged with distance education professors and following up on them, which was called the National Committee for Distance Education, and through it and in addition to the policy and strategy of the Ministry in sending this form of training, which It has become a basic training, so that the Algerian university is in the ranks of international universities. (<http://djoudi.online.fr>)

Starting from the academic year 2023/2024 and starting from the first semester, distance learning has become relevant to all horizontal units and exploratory units, stressing that the digital platforms designated for distance education have become equipped with lessons so that the student can continue his education, even if it is outside school hours. (<http://djoudi.online.fr>)

Distance education is education that relies on electronic technologies, solutions that have been around for years, but Algeria did not rely on them, and with the Corona epidemic, they were forced to return to these solutions, and they respond to the requirements of educational institutions in the case of immobility, and they gave an acceptable result, through the discovery of professors and students. Electronic platforms allow them to follow lessons, and there are attempts to find electronic content in the form of texts and videos. These solutions have enabled Algeria to benefit from them and not lose a white year in education, as a result of the quarantine. (<http://www.ksu.edu.sa>)

-E-Learning

E-learning is defined as a process of teaching and learning using electronic media, including the computer and its various programs, networks, the Internet, electronic libraries, and others, all of which are used in the process of transferring and communicating information between the teacher and the learner, intended for specific and clear educational goals. (<http://elsada.net>)

3.3-Contribution of digitization to the improvement of higher education :

The application of digitization in the higher education sector contributes significantly to raising the quality and advancement of the educational process.

The transition from traditional education to modern education based on information and communication technologies, and this is what we will reflect

on the various elements of the educational process, and the most important implications can be presented as follows :(
<https://u.ae/ar-ae>)

- Developing the professor's analytical ability and providing him with all the latest developments in his field of specialization;
- Moving from the role of indoctrination of knowledge to the role of activator and facilitator of the educational process;
- Contributing to achieving the desired quality in the educational

process;

- Saving effort and saving time during the educational process;
- Providing a synchronous and asynchronous educational environment based on self-learning and mutual interaction with students;

Digitization has contributed greatly to achieving the principle of transparency and equality and significantly reducing the spread of corruption, and this is what...

It is currently observed that, for example, regarding the processing of promotion files for the research professor, as well as the filing of various promotion files

It takes place via a digital platform [https:// progres mesrs webgrh/dz..](https://progres.mesrs.webgrh/dz..), and files are processed through

Reasonable deadlines not exceeding twenty days for announcing the results, which adds transparency and flexibility in processing files.

Algeria's implementation of the comprehensive digitization strategy has contributed to all sectors, especially the higher education and research sector

Scientific research aims to improve university services provided, especially education, and raise the quality of scientific research.

One of the most important advantages of digitization is eliminating digital files by converting them to easy encrypted files

Use, which relieves the service seeker from the trouble of searching for the required documents and moving to a different one

Facilities for extracting documents, because adopting digitization means creating platforms and networks that preserve information and deliver it

Exchange it between various ministries and sectors without requiring the person to provide justification from a concerned department.

I witnessed

University registrations for the academic season 2023-2024.

Complete digitization for all stages of registration from one stage

Guidance to final registration and registration in various university services (transportation, food, housing).

4. CONCLUSION

At the conclusion of this intervention, we can say that the Algerian government, like other countries, sought through backward attempts to reduce the gap in the use of modern technology in the higher education sector, and thus developed strategies and programs to achieve this desired goal and to embody what is called digital education on a broader scale, but the latter It is broadly linked to the culture of dealing with technological innovations through what As previously

mentioned, we could say that adopting a digital educational system in Algeria that keeps pace with the current developments that the world is witnessing is preceded by an important and necessary step, which is striving to embody the so-called culture of dealing with technological innovations, which is the first basis for adopting any innovation or innovation. For the sake of the effectiveness of technology on the higher education sector, no It is necessary to increase focus and expand a solid base on the culture of dealing with this modern type of technology in the sector. Among the results of the study were the following:

- Electronic services contribute to improving the quality of educational services

The digital platform contributes to preserving all information of students, professors, and administrators.

- Reducing costs on tires through remote configuration using modern technological techniques.

- A digital platform for several electronic portals such as Progres.

- Establishing a national information system through digitalization

The problem remains in the speed of Internet flow.

5. Bibliography List :

1. Books :

-Kenneth Fee,.(2009). "Delivering E-Learning A complete Strategy for Design Application and Assessment" . London: Kogan.

- Marie Prat, ,(2008) Réussir un projet: Pédagogie, méthodes et outils de conception déploiement, évaluation, (France :coll. Objectif Solutions, Corime, Hervo - Eni, Imprimerie

2. Printed article:

- Hanane Zermane , Samia Aitouche (2020),: Digital Larning With Cvide-19 In Algeria, Int. J. of 3D Printing Tech. Dig. Ind., 4(2)

3. **Online journal:** Nucci, F., Puccioni, C., Ricchi, O., Digital technologies and productivity: A firm-level investigation, Economic Modelling (2023), doi: <https://doi.org/10.1016/j.econmod.2023>.

- Umair; T, Marios; D, Nikos. R , Shamaila, I, Leonidas, S, George, V, A fuzzy TOPSIS model for selecting digital technologies in circular supply chains, Supply Chain Analytics, <https://doi.org/10.1016/j.sca.2023>.

-El-Kassim, A. (2020, Mai 07). Al-Mirsal. Récupéré sur <https://www.almrsal.com>.

Djabir, Alaa;. (2018, Octobre 14). Récupéré sur <https://mawdoo3.com>.

-eLEARNING IN ALGERIA, Experiences On E- (2020) Mahieddine Learning in Algerian Universities; in sit: <http://djoudi.online.fr>.

Internet websites:

<https://fll.univguelma.dz/ar/content/%D9%85%D9%86%D8%B5%D8%A9-progres#:~:tex>

[https://seu.edu.sa/ar/notfound/?aspxerrorpath=/sites/ar/AboutSEU/Pages/Elearning.aspx%20%d8%8c%20\(%d8%b2%d9%8a%d8%a7%d8%b1%d8%a9%20%d9%8a%d9%88%d9%85:25/03/](https://seu.edu.sa/ar/notfound/?aspxerrorpath=/sites/ar/AboutSEU/Pages/Elearning.aspx%20%d8%8c%20(%d8%b2%d9%8a%d8%a7%d8%b1%d8%a9%20%d9%8a%d9%88%d9%85:25/03/)

-<https://mobt3ath.com/dets.php?page>.

-<http://elsada.net/121881>.

-<http://www.ksu.edu.sa/seminar/futue-school/index2.HTM11>

-<https://dsrs.ksu.edu.sa/ar/node/1339>

<https://www.it-pillars.com>

<https://u.ae/ar-ae>