

Algeria Electronic Administration in the Education Sector and Its Role in Improving Public Service - Case Study: Directorate of Education for the wilaya of M'sila

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Abstract : This research paper aims to highlight the role of the digital management system in improving administrative performance in the national education sector as one of the most important strategic sectors. This study dealt with the theoretical part of the basic concepts of digital administration and public service and its role in rationalizing administrative performance. As for the field side, it highlighted one of the leading directorates the concerned and officials in the sector through a descriptive, inductive study. The research reached several results, the most important of which is the extent of digital administration's contribution to facilitating and simplifying administrative transactions and completing them with high speed and accuracy, and made a qualitative leap in the performance of the public service in the education sector, but it was not without many obstacles and shortcomings.

Keywords: Digital administration, public service, education sector, rationalization of administrative, Improving public service.

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1. Introduction

The current global reality is witnessing remarkable progress in the field of information and communication technologies, which has directly affected human lifestyles—including the administrative domain, which has shifted from the traditional paper-based model to a dynamic electronic model based on internet capabilities and business networks. Like other developing countries, Algeria is striving to keep pace with this digital evolution by attempting to draft a roadmap for its digital transformation project, which has become a pressing national priority—especially in sensitive and educational sectors. The education sector, in particular, has recently undergone fundamental reforms and modernization through the integration of information and communication technologies into administrative operations and the management of human resources. This transformation is driven by the sector's critical importance as a vital and sensitive component of the state, representing its most significant source of human capital and directly linked to the development of future competencies. Therefore, its administrative management requires updating to achieve the desired outcomes, promote its advancement, and ensure transparency and efficiency in governance to meet strategic goals.

This research paper aims to explore **the current state of digitization in the education sector and to assess the extent to which it contributes to rationalizing administrative work and improving public service.**

The significance of this study stems from its focus on a crucial topic related to the management of the educational system, aligning with the efforts of the Ministry of National Education to elevate this sector and enhance its administrative performance in particular. This is what we seek to highlight, while also proposing suggestions to address the limitations and obstacles of digital administration and improve overall performance.

our motivation for choosing this topic is personal, given that I am part of this administrative system. As researchers, it is our responsibility to continually seek solutions and document the realities surrounding us in our daily and professional practices. We aim to shed light on the overlooked aspects of the subject in order to foster positive change that could contribute to the development of public administration in Algeria, elevate it to the level of advanced nations, and reduce the bureaucratic burdens that have long weighed on the employees and users of this sector.

To carry out this study, we will rely on the descriptive approach to present the theoretical framework and discuss various points, alongside the inductive approach to analyze the current reality and evaluate the efforts of the Directorate of Education of the Wilaya of M'sila in digitizing its administration and mobilizing all available material and human resources. This will be done through observation and personal interviews with employees of the digitalization office at the directorate and various users of digital platforms, particularly school principals, who act as intermediaries between the supervisory authority, the institution, and parents.

To comprehensively address the topic, we have divided the study into two main parts. The first part deals with the conceptual framework of digital administration and public service, while the second part focuses on the practical procedures for implementing digital administration in the education sector and its impact on the rationalization of public service, along with the challenges encountered. This will be analyzed through a field study at the Directorate of Education of the Wilaya of M'sila, in order to evaluate the experience and the improvements it has brought to the quality of services provided.

2. Conceptual Framework of the Study

2.1. The Concept of E-Administration

The common understanding of e-administration is that it involves replacing paper-based procedures with digital processes, and substituting the traditional office with an electronic office through the extensive use of information technology—transforming public services into systematically executed administrative procedures. (Alaa Abdul & Hassan Al-Salmi, p. 32)

E-administration is defined as a modern administrative approach that utilizes information and communication technologies to carry out various administrative tasks, with the aim of improving administrative performance, increasing efficiency, and achieving predetermined goals. (Abu Ashour & Al-Nimri, 2013, p. 203)

It is also described as the process of converting all traditional administrative work and services into electronic operations that are carried out with high speed and exceptional accuracy, without the use of paper. (Al-Ayyat, 2015, p. 10)

Thus, digital administration can be considered a paperless management system, where administrative tasks are executed using technology instead of paperwork. It is characterized by being independent of time and place, as it relies on information systems and communication technologies.

2.2. Motivations for Transitioning to E-Administration

The main reasons for adopting the e-administration approach can be summarized as follows:

a. The rapid advancement of technology and the accompanying knowledge revolution:

Employing modern technologies for the benefit of both the administration and citizens yields multiple advantages. It improves institutional performance and offers opportunities to invest in the tech sector, which in turn facilitates daily life and enables the use of global technological advancements. (Sadeqi, 2020/2021, p. 130)

b. Increasing administrative efficiency : The application of information technology reduces the number of steps involved in manually processed services. This naturally decreases the time required to complete transactions and services, saving time and effort, and easing congestion and delays. Studies have shown that adopting electronic systems and internet-based solutions in areas such as human resources, finance, supply chain, and production operations can reduce costs by 10–20%, which is equivalent to increasing income by 30% or more.

c. Globalization trends focused on strengthening human connectivity: These trends have prompted many countries to enhance their public services in pursuit of international quality certifications and, more importantly, to satisfy citizens. With global standards now available, people are able to compare their country's services with those of more advanced nations offering superior quality to their citizens.

d. Political Factors: Democratic transitions and the resulting social changes and popular aspirations have been among the key driving forces pushing many administrative bodies to generalize the use of technological applications in their operations. Global liberation movements contributed to guiding the systems of these countries to incorporate technology into their administrative practices, prompting them to improve public participation in governmental decision-making. In this context, e-administration became a valuable opportunity for these systems to fulfill the hopes of their citizens. (Lacheheb , 2016/2017, p. 17)

e. Transparency: Promoting transparency is directly linked to combating administrative corruption, which increases the complexity of routine procedures and makes democratic governance seem unattainable. Corruption fuels public pessimism and reduces foreign aid to countries. E-administration helps reduce bribery, enhances political transparency, and strengthens citizens' trust in the administration. **(Ben Mersli , 2020/2021, p. 30)**

f. Growing Citizen Pressure to Improve Services:

There has been increasing public pressure on governments, along with rising citizen expectations for better, faster, and easier access to services and information. This trend has been reinforced by public awareness of the right to access information and understand the mechanisms of political decision-making. Additionally, public employees increasingly require qualitative support through a robust information base and a modern, well-structured work system. **(Bousalem & Belgaziyah, 2022, p. 17)**

2.3. Requirements for Implementing E-Administration

Like any other project or program, the e-administration initiative requires a well-prepared and suitable environment that aligns with its operational nature in order to succeed and achieve its objectives. Therefore, several key requirements must be taken into consideration, including:

a. Administrative and Technical Requirements:

- The transition to e-administration requires full conviction and a clear strategic vision from top leadership—whether at the institutional, ministerial, or national level—to shift all paper-based transactions to electronic ones, along with full support and the necessary resources for this transformation. **(Bouzekri , 2015/2016, p. 87)**
- E-administration also necessitates changes in organizational structures to suit its functional nature. This includes the creation of new departments, elimination of redundant ones, or merging existing units, in addition to revisiting internal operational processes to ensure the right conditions for an efficient and fast digital management system. **(Moussa & Quraishi, 2011, p. 90)**
- Providing the essential infrastructure for successful e-administration applications, including telecommunications, internet, and network systems, as well as modernizing institutions with the latest advancements in communication and information technologies. **(Hussein, 2010, p. 24)**
- **Availability of Necessary Electronic Tools:** This includes having the necessary electronic means to benefit from the services provided by e-administration, such as personal and laptop computers, network phones, and other devices that enable access to the internet or local networks—at reasonable prices that make them accessible to most people.
- **Adequate Funding:** A sufficient level of funding is required to enable the administration to conduct regular maintenance, train staff and employees, maintain a high standard of service delivery, and keep pace with any advancements in the field of technology and e-administration. **(Mohammed bin Said , 2008, p. 66)**

b. Human Resource Requirements: This refers to the availability of skilled personnel dedicated to the digitization of institutions—such as IT engineers and technicians responsible for managing the institution's digital systems. These professionals are tasked with creating computer networks, installing devices, and implementing software related to digital transformation. It is essential to train and qualify administrative staff in the effective use of information technology tools. Additionally, public awareness programs should be launched to educate the broader society. **(Bourzeg & Bouanini, p. 06)**

c. Legal Requirements: This includes the issuance of laws, regulations, and procedures that facilitate the transition to e-administration and accommodate its demands. Since most current legislation was developed in a traditional context, it is based on in-person interactions between service providers and recipients, and the reliance on certified documentation. Transitioning to e-administration requires a different legal environment. The presence of appropriate legislation helps support the operations of e-administration and grants it legitimacy and credibility regarding all legal outcomes. (Moussa & Quraishi, 2011, p. 91)

d. Security Requirements: Security requirements for e-administration involve ensuring the safety and protection of its data, which is a valuable and highly sensitive asset. This information is vulnerable to threats, breaches, and hacking attempts by intruders and cybercriminals. To protect data from such risks, several elements must be considered to ensure adequate information security: (Bouzekri, 2015/2016, p. 92)

- **Authentication:** Verifying that all participants in the process are indeed the intended and authorized individuals.
- **Authorization:** Ensuring that only designated individuals are permitted to access electronic information.
- **Integrity:** Confirming that no manipulation or alteration has occurred to the data during transmission, from sender to receiver.
- **Confidentiality:** Ensuring that unauthorized parties do not gain access to sensitive information.

2.4. The Impact of E-Administration on Public Service Reform

Before discussing the impact of e-administration and its role in reforming and rationalizing public service, it is essential to first define the concept of public service, its characteristics, and the criteria used to evaluate its quality.

2.4.1. Definition of Public Service : Public services are defined as any service provided by public institutions to the general public or to a specific group, under the supervision and control of the state, aiming to serve the public interest—such as protecting property, promoting economic mobility, or fulfilling citizens' essential life needs. Accordingly, public institutions are classified based on their fields of specialization. (Sadeqi, 2020/2021, p. 59)

Public service is also described as an integrated mix of tangible and intangible tasks and activities offered by the state and its affiliated institutions to all members of society. Its purpose is to meet citizens' needs, reform public administration, and build trust between the government and its people. (Yahiaoui, 2022, p. 68)

From the above definitions, public service can be considered any activity or function performed by public administration or public entities for citizens—services that are essential for society and are guaranteed and monitored by the state or governing authorities. Public service has several distinguishing characteristics, including: (Rahawi & Kassimi, 2017, p. 110)

- It responds to a vital public need. Without such a need, there would be no justification for establishing various public facilities aimed at meeting the population's diverse requirements.
- Serving the public interest is the primary motive behind the provision of public services. Thus, these services must be accessible to all, without discrimination, and delivered under equal conditions and procedures.
- The ultimate goal of public service is to preserve human dignity and well-being, and to raise living standards by continuously improving the quality of services provided.

2.4.2. Criteria for Measuring Public Service Quality : The quality of public services is measured by how well they meet the needs and desires of the beneficiaries—particularly in terms of timeliness, accuracy, and the psychological experience associated with the service process. Public service quality can thus be determined based on users' perceptions and their level of satisfaction. (Rais & Ben Cherif, 2022, p. 153). In light of this, the main criteria for evaluating public service quality include: (Zine & Hafouda, 2018, pp. 371-395)

a. Privacy: Protecting citizens' personal data, such as income and credit card numbers, from unauthorized access or misuse—ensuring that this information remains confidential and is not exploited.

b. Integration: Avoiding inconsistencies or contradictions in information and service procedures across different agencies. Ideally, e-services should be offered through a unified portal that brings together all relevant entities involved in service delivery.

c. Credibility: Ensuring the accuracy and legal validity of information and forms obtained through official electronic platforms, and verifying that all required data are correctly completed.

d. Trust and Security: Protecting citizens' data from loss or damage, providing users with confirmation of completed transactions, and enforcing legal regulations that govern electronic interactions and transactions.

e. Speed and Accuracy: Ease of access to government service websites, with the availability of accurate and reliable information and data.

f. Interactivity: Allowing citizens to complete a full service, including electronic payment and the ability to provide feedback on the services received.

2.4.3. The Role of E-Administration in Rationalizing Public Service

a. Reducing Bureaucracy and Routine: E-transactions reduce reliance on paper documentation, replacing it with electronic documents. The e-administration system also gradually helps overcome issues like favoritism and mediation in public service delivery. (Merakchi & Fgaier, 2017, p. 187)

b. Improving Administrative Performance E-services are delivered with the required speed and efficiency, avoiding manual errors. Transaction data flows smoothly and securely, providing transparency and enabling tracking of each process step at any time. The public can simply browse the official website and complete transactions in a single step without visiting multiple offices. (Haddar, 2017/2018, p. 113)

c. Cost Reduction: Traditional administrative procedures consume large quantities of paper, documents, and writing supplies. They also require several employees to process and verify requests, which increases service costs due to the high price of required materials. E-administration reduces these costs significantly. (Bousalem & Belgaziyah, 2022, p. 16)

d. Continuous Development: One of the core principles of e-administration is ongoing improvement and development. It continually seeks to upgrade performance levels, whether to meet user satisfaction or to achieve excellence in competitive service quality. (Rahawi & Kassimi, 2017, p. 115)

e. Accuracy, Accountability, and Service Clarity: Services are carried out according to precise standards defined by information processing systems, which reduce administrative errors and limit abuse. Full integration of information technology in public service delivery allows accountability for every task or action, supported by digital publication of all service stages. (Achour, 2009/2010, p. 66)

3. The Reality of Public Service Digitalization in the Education Sector

Through this research paper, we aim to shed light on one of the country's most foundational sectors—education—as it forms the core of individual development. The Algerian state has been actively working to modernize and revitalize this sector, issuing multiple policies and decisions, including the decree dated December 28, 2010. This decree established a national committee and provincial subcommittees for digitizing administrative and educational management in the education sector. These bodies are tasked with developing practical technical and administrative plans for digitization and overseeing the process across all provinces.

As a result, a range of digital administrative and educational applications were designed and implemented, embedding an electronic information system in the management of all administrative operations, under the slogan: "**Paperless Administration.**"

As a model, we chose the **Directorate of Education for the Wilaya of M'sila**, as it is a leading province in the field of digitalization and among the pioneers in adopting this approach.

To explore this, we conducted a field visit to the digitization office at the directorate and carried out a personal interview with **Mr. Salem Walid**, the digitization officer and a senior technician specialized in networks and operating systems. He welcomed us and introduced us to the different departments and units of the directorate, with a particular focus on the responsibilities handled by the digitization office, which include:

- Updating records of new and existing educational institutions (creation, modification, etc.).
- Updating administrative accounts (creation, modification, etc.).
- Electronically monitoring the back-to-school process (schoolbooks, pedagogical staffing, overcrowding status, school transport and canteens, school grants, unassigned teaching groups, student transfers, etc.).
- Digital updates carried out by various offices based on their specific areas of responsibility (allocating schools to relevant offices, assigning administrative and pedagogical ranks to appropriate units, associating subjects with relevant departments, etc.).
- Additional digital operations managed by each office include: inter-provincial transfers of administrative and pedagogical staff, updating student and staff data, career advancements, issuing official documents such as service records and work certificates, generating various statistics on students and staff, managing files of higher education graduates and contract workers, staff mobility and rank promotions, and processing requests for inter-provincial transfers (entry and exit).

The interview focused on several inquiries concerning the current state of digitalization in educational institutions' administrative management, summarized in the following 10 key questions:

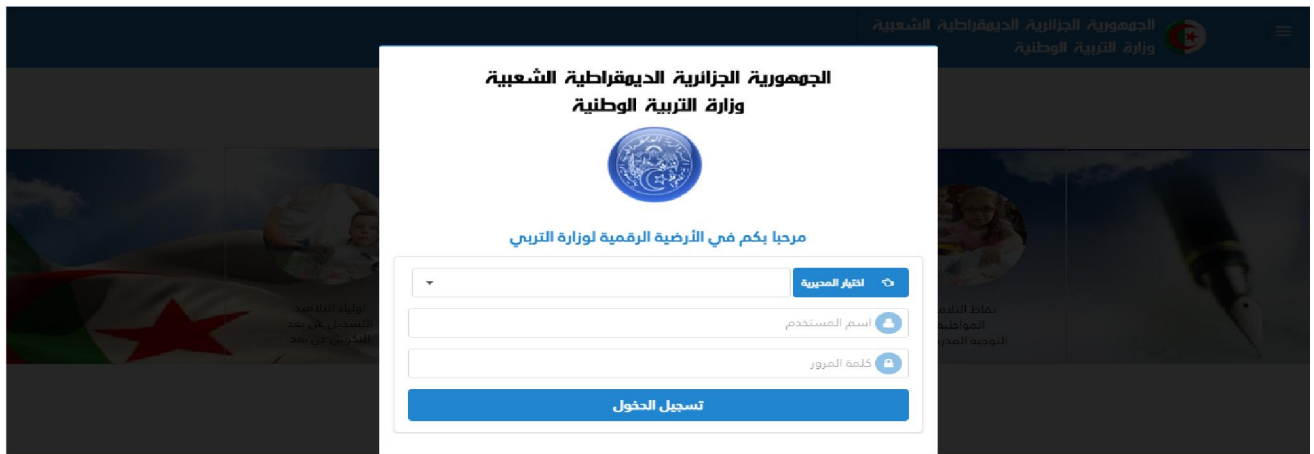
1. What administrative operations in educational institutions have been affected by digitalization?
2. Which procedures are still carried out manually in the traditional way?
3. Do you believe that the state provides sufficient material and human resources to ensure the success of the digitalization project in the education sector?
4. Have any training sessions been organized on how to use these digital platforms—either for staff members operating them within institutions or for the digitization office personnel?
5. In your opinion, what are the benefits introduced by digital administration, and what are the drawbacks or challenges that have had a negative impact?

6. What obstacles have hindered the digitization process?
7. What is your opinion on the role of digital administration in financial management and its contribution to cost rationalization?
8. Has digitalization helped reduce the administrative burden on different departments and offices within educational institutions?
9. Are all digital operations managed locally at the office level, or are they still centralized by the Ministry?
10. Are the platforms and programs completely secure and protected from cyber-attacks or data breaches?

From these questions, we gained insights into the platforms and digital spaces developed by the Ministry, the most prominent of which are:

- The “**Script**” program, considered an internal information system that directly links the school to the relevant departments within the directorate.
- The **digital platform of the Ministry of National Education**, where all operations related to students and staff are processed. This platform is accessed via the official portal: <https://amatti.education.gov.dz>, using login credentials (username and password) provided by the digitization office upon the school principal’s request and in their personal presence. This platform was officially launched during the **2015/2016 academic year** and has undergone significant development since then.

Figure 1. The Digital Platform of the Ministry of National Education



Source: Digitization Office – Directorate of Education, Wilaya of M’sila.

This platform comprises four core programs that are interconnected and integrated with one another. Therefore, it is essential to ensure timely updates and accurate data entry by digitizing the records of administrative staff, teaching personnel, and students. Each individual is assigned a unique identification number.

To achieve this, educational institutions distributed forms to staff members and teachers to collect all relevant personal information. The process was also extended to students across all three educational levels. These forms included specific information about students with medical conditions and those with special needs, as well as details regarding their social status for the purpose of qualifying for the 5,000 Algerian dinars school grant.

As a result of these procedures, a unique ID number was assigned to every employee in the sector—teachers, administrative staff, and support workers—as well as to each student. This shift allowed the Ministry to manage individuals through identification numbers rather than by name, enhancing efficiency and data organization.

Figure 2. The Digital Platform of the Ministry of National Education – Institution Space

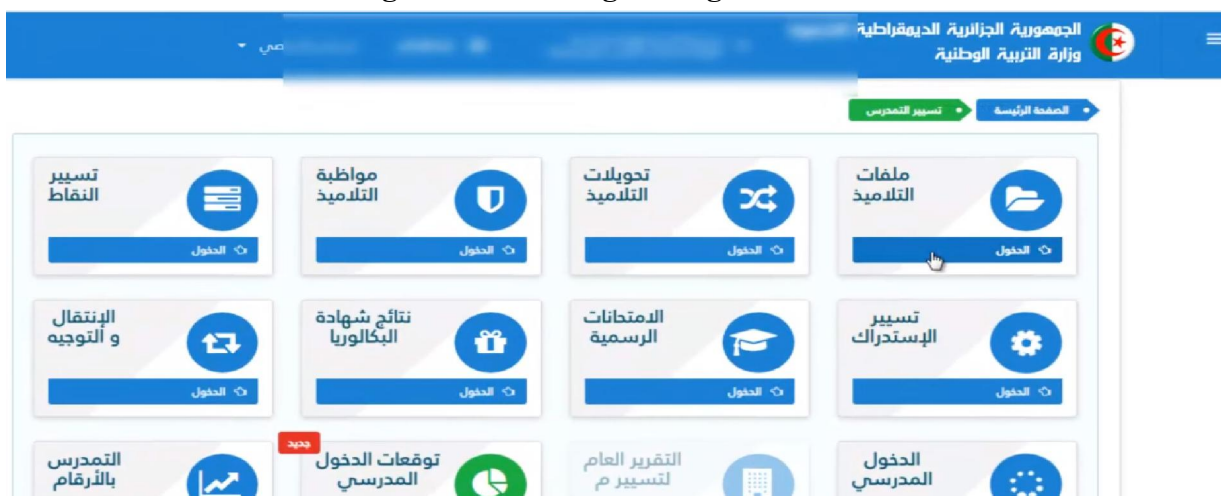


Source: Digitization Office – Directorate of Education, Wilaya of M'sila.

This figure illustrates the content of the institution's digital platform. On the main page, the icons are arranged from right to left in the following order:

1. **Schooling Management Icon**(Includes student grades, attendance, and academic orientation)
2. **User Management Icon** (Covers promotions, qualifications, and recruitment).
3. **Infrastructure Management Icon**(Allows for monitoring of facilities, functional housing, and comprehensive surveys).
4. **Parents' Space Icon**(Provides services such as remote registration and online training).

Figure 3. Schooling Management Icon



Source: Digitization Office – Directorate of Education, Wilaya of M'sila.

This icon includes everything related to student schooling. It features student files through which the personal information of all enrolled and withdrawn students is recorded. It allows the extraction and printing of school certificates, information forms, and each student's electronic

file with just one click. Previously, this process required multiple documents, registers, and personnel responsible for handling registrations and requests for school certificates, taking up to three days to complete.

Additionally, student transfers are now processed without the need to physically visit. The guardian simply sends a request through the platform by clicking a designated button, which is sent directly to the school principal with the status "Under Review." Once approved or rejected, the response is returned to the guardian's account with a notification of the outcome.

This icon also contains information relevant to educational counselors, such as the daily monitoring of student attendance by logging absences and tardiness and generating automatic monthly reports. It also allows for managing student grades, which are entered electronically by subject teachers, resulting in the automatic generation of report cards. The system also automatically identifies students eligible for remedial exams (those with average scores between 9 and 9.99).

Furthermore, registration for national exams is now conducted automatically through this platform, with registration fees paid via the "gold card" using a dedicated link, and exam invitations generated automatically. After the results are published, they are instantly displayed through this icon.

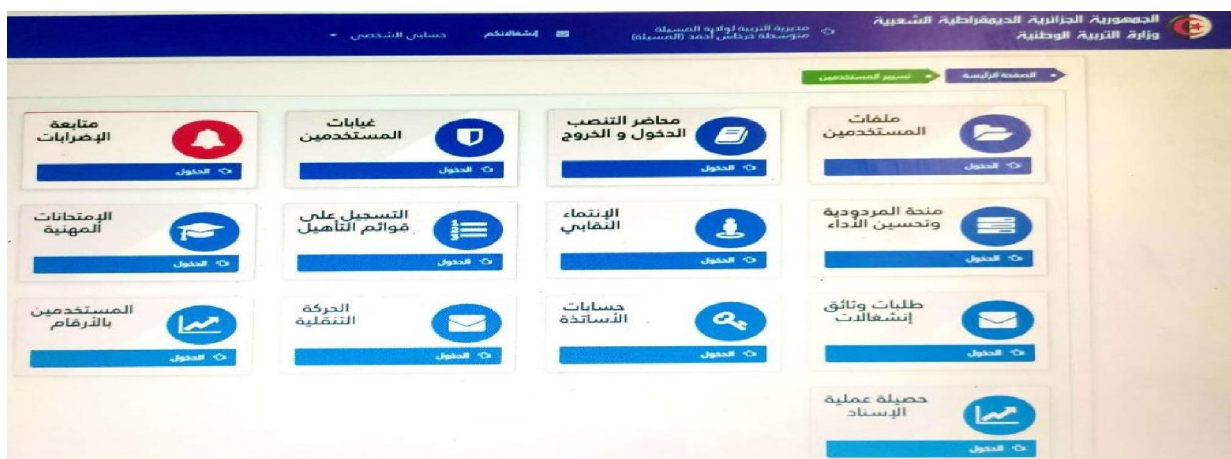
There is also a separate icon for guidance counselors titled "**Transition and Orientation**," which includes follow-up and orientation forms that can be printed after the assessment procedures are completed. It also allows the reception of student transfer records from incoming students and the sending of transfer records for students moving to other educational levels.

These interlinked and integrated programs are grouped under the "**Back-to-School**" icon, which includes nominal student lists after class grouping, re-enrollment of previously withdrawn students, October 1st status reports, and management of educational groups.

A newly added icon titled "**Back-to-School Forecasts**" provides statistical data that enables school principals to organize and develop strategic plans and allocate the necessary resources for a successful academic year, while avoiding shortcomings and imbalances.

Finally, the platform automatically generates a **year-end summary report**, offering a comprehensive overview of all operations and general statistics on students (by category, age, total numbers, academic performance, grade distributions, and performance analysis), once all prior processes are completed.

Figure 4. User Management Icon



Source: Digitization Office – Directorate of Education, Wilaya of M'sila.

It is considered a digital portal available to all educational institutions across all levels (Primary, Middle, and Secondary). It is specialized in a set of operations related to staff members and contains all information related to employees' personal files (teachers, administrators, professional workers), including attendance and departure logs at the beginning of the year, monitoring daily attendance and absences, and calculating performance bonuses that were previously done manually by providing a specific report from the Personnel Expenses Management Office and manually grading them with a pen before sending them back to the same office via a transmission table. This process consumed time and effort, taking up to two days for travel. Additionally, the process of promotions and qualification is now electronic and automatic when the promotion period opens, and the employee receives their invitation, including all information (dates, times, and exam schedules) without the need to travel to the Examination and Competitions Office.

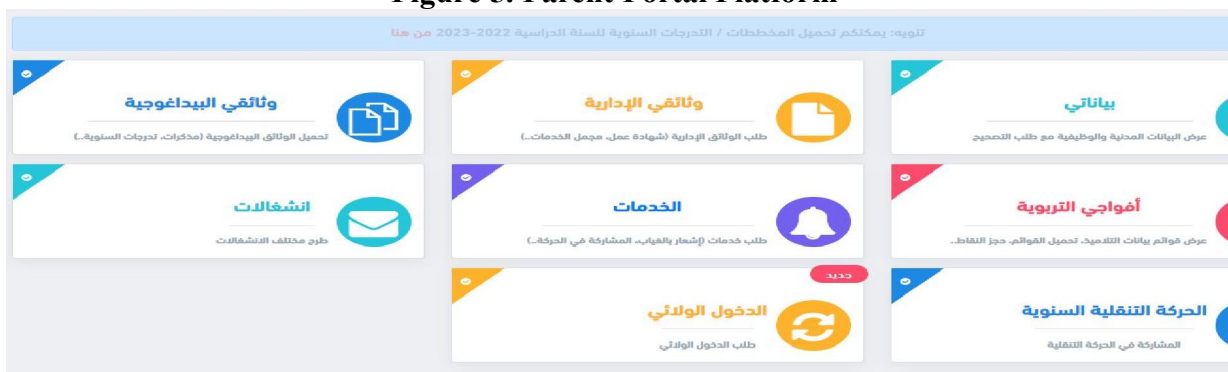
If there are any errors in any personal information or professional document extraction, the employee can correct them with just the click of a button. This allows them to submit a request through their dedicated portal, which automatically appears in this icon without the need to visit various offices within the institution.

In the last two years, two important elements were added to this platform: monitoring strikes to track professional and security conditions within the institution, and the mobility icon, which was a qualitative leap in the digital transformation of the sector. Through this icon, employees can now view all lists of vacant or soon-to-be vacant positions, submit their preferences, and be rated by the concerned personnel (manager's rating and inspection rating). The information is then automatically processed, and results are sent in a remarkably short time of less than a month, whereas it previously took over a month.

The Ministry of National Education also announced the opening of a special portal for teachers, where registration is done remotely via the website <https://ostad.education.gov.dz>. Teachers are required to enter their full data, verify its accuracy, print the form, and then head to the affiliated educational institution for confirmation and account activation.

This platform provides various services, including obtaining administrative documents (salary slip, certificate of employment), obtaining pedagogical documents (downloading memos, annual outlines), providing lists of groups such as (registration in mobility, absentee notifications, free concerns to communicate with relevant authorities), and educational groups (viewing and printing the educational group lists assigned to them, sending pedagogical notes directly to parents via their dedicated platform, and recording grades).

Figure 5. Parent Portal Platform

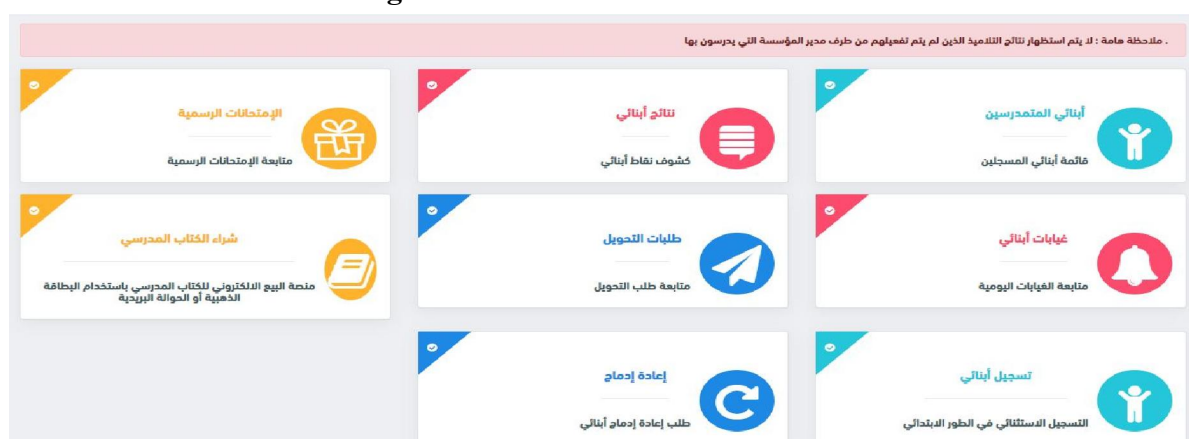


Source: Digitalization Office, Directorate of Education, Wilaya of M'sila.

The Ministry of National Education also announced the launch of an information system that allows parents to view their children's school results and benefit from remote services via the digital platform for the education sector. To benefit from these services, each parent must register in this platform by accessing the website <https://tharwa.education.gov.dz> and entering all the information related to their enrolled children. The parent then prints the registration form for each child and heads to the school where the child is enrolled to confirm the registration and verify the parent's identity. The school director will activate this icon, granting access to all services provided by this system, including tracking the child's academic progress (results, absences), submitting requests for school transfers, retrieving official exam invitations and displaying results, submitting requests for re-enrollment, and using the icon to purchase school books using a gold card without needing to visit sales points or wait in crowded lines.

In the 2022/2023 academic year, exceptional procedures were introduced for the digital registration of primary education, specifically for preparatory classes and first grade. Parents submitted applications through this platform and waited for approval from primary school directors, with no human intervention and in an automated manner, based on a set number (no more than 35 students per class). This process was a trial to extend digital registration to other levels in all educational stages.

Figure 8. Parent Portal Platform



Source: Digitalization Office, Directorate of Education, Wilaya of M'sila.

After familiarizing with most of the processes involved in the digitization of administrative management in the education sector, the head of the Digitalization Office began, answering the questions posed based on personal data and perspectives. He confirmed that most administrative procedures and operations are now done digitally. However, in some cases, such as gathering statistics, it is not possible to rely solely on the data from the digital platform, as it contains many discrepancies. Additionally, some institutions located in remote areas suffer from poor or disrupted internet access, which necessitates reverting to traditional manual methods. Thus, while digitalization is in place, it does not eliminate the need for paper documents, which are considered essential proof to justify all actions taken, especially in sensitive cases.

He also stated that the state has made significant efforts to ensure the success of the digitization project in the education sector, but challenges remain due to limited material and human resources. The sector still faces many obstacles, such as a lack of expertise and competence, due to the outdated methods of hiring and selecting employees, which still rely on traditional employment standards. Additionally, there is a lack of training and retraining

programs for employees and organizational bodies in light of the digital transformation. Some individuals still prefer traditional methods due to their lack of awareness about electronic administration and its complexity, as they lack knowledge in this field.

From his perspective, the advantages of digitization include better control over employees' career paths, including promotions, qualifications, recruitment, and professional exams, faster document processing, the ability to prepare reports and surveys quickly, transparency, and speed of implementation. Digitization has also significantly reduced pressure on various offices and institutions, whether in receiving employees for document issuance or archiving, which has now become digital. This has helped optimize costs by eliminating the burden of paper-based work and reducing the need for a large number of staff to carry out various operations, as well as avoiding travel costs.

Despite these advantages, the platform is still centrally controlled, as some icons can only be activated during specific periods (such as transfers, mobility, textbooks, grants, etc.). They cannot be used until requests are made to the ministry for reactivation, which creates significant management challenges.

As for the security and confidentiality of the digital platform, he mentioned that it has excellent protection that is almost impossible to breach, relying on Algerian servers in coordination with the Ministry of Digitalization and Statistics, which has highly skilled technical and programming staff. The platform records all movements, clicks, and authorized login operations, with time and date stamps.

As an addition to enrich the research, we were honored to attend and participate in the Provincial Seminar on Evaluating Digital Transformation in the Education Sector, which took place on December 4 and 5. The seminar was organized at one of the educational institutions, in line with the program of the President of the Republic and in implementation of his instructions during the Cabinet meeting held on December 24, 2023. In that meeting, he emphasized the need for the digitization process to be comprehensive across all government sectors. In this context, we can say that the digitization process, which began in early 2015, reached its peak at the end of 2021 through a series of circulars, including but not limited to the following:

1. Ministerial Circular No. 230, dated January 31, 2018, defining the reference framework related to the information system of the National Education sector.
2. Ministerial Circular No. 253, dated February 6, 2018, regarding the organization of a videoconference seminar on the information system of the National Education sector.
3. Ministerial Circular No. 253, dated February 6, 2018, regarding the organization of a videoconference seminar on the information system of the National Education sector.
4. Ministerial Circular No. 535, dated March 15, 2018, concerning the extraction of second-term report cards from the information system of the National Education sector.
5. Ministerial Circular No. 1737, dated December 8, 2018, concerning the use of the information system of the National Education sector.
6. Ministerial Circular No. 23, dated January 8, 2019, concerning the evaluation and assessment of the information system of the National Education sector.
7. Ministerial Circular No. 36, dated January 31, 2023, regarding the management of housing.
8. Ministerial Circular No. 541/06.01/2023, dated May 15, 2023, concerning supplementary arrangements for the annual teacher mobility process for the 2023/2024 academic year in the information system of the National Education sector.

9. Ministerial Circular No. /94, dated March 27, 2023, regarding the registration of children for the first year of primary education for the academic year.
10. Ministry of Education Announcement, dated July 3, 2023, regarding the digitization of the provincial entry and exit process.
11. Ministerial Circular No. /253, dated April 2, 2024, concerning the arrangements related to the annual teacher mobility process in the information system of the National Education sector.
12. Ministerial Circular No. /36, dated April 27, 2024, regarding the registration of children for the first year of the 2024/2025 academic year via the information system of the National Education sector.
13. Ministerial Circular No. /96, dated May 23, 2024, regarding the organizational arrangements for the digitization of the student guidance and re-guidance processes for the 2023/2024 academic year.

After fully engaging with the President's program and relying entirely on the national digital strategy, and for continuous development, the Ministry adopted a participatory approach to improve digital services in the sector's information system by involving all stakeholders and active partners in the education sector. This was done through the organization of provincial seminars followed by a national seminar on April 26, 2025, which included five workshops. Various officials, partner representatives, and sector employees from the province participated, aiming to assess the achievements and goals reached so far in all fields, mainly related to administrative and pedagogical management, especially those that directly affect the students' school life, the career paths of sector employees, and the management of school facilities and structures. The seminar also focused on identifying challenges and difficulties related to organizational, technical, material, human, informational, and awareness-related aspects that users of the information system still face, along with proposing solutions to overcome them, particularly those related to data security and the protection of personal data. Additionally, proposals were made to improve procedures and processes being handled, as well as suggesting new processes for future digitization. These five workshops culminated in a document that comprehensively summarizes these elements (achievements, recorded difficulties, proposed solutions, possible improvements, newly proposed digitized processes, information security, protection of personal data, publicity, media, improvement, and the scheduling of operations and their durations). The main achievements of the digitization of various administrative and pedagogical processes in most departments included:

a. Related to Student Enrollment:

- Formation of the student identification number.
- Registration of children in preparatory education and the first year, as well as re-registration of students who were struck off or came from the "Echbab El-Omma" schools and from abroad.
- Automatic grouping.
- Transfer of students from one institution to another.
- Managing students' grades for each term.
- Guidance and re-guidance of students and handling of appeals.
- Requests for re-integration of students directed to vocational training.
- Management of national school exams and the assessment exam at the primary education.
- Management of compensation for exam supervisors.
- Electronic payment for registration fees for school exams and recruitment competitions.

- Student transfer from the category of people with special needs.
- Management of student attendance.
- Extracting and downloading documents.
- Managing statistical data to support decision-making.

b. Related to User Accounts:

- Creation of accounts for school directors, managers, and heads of departments and offices at the education directorates.
- Creation of teacher accounts.
- Creation of parent accounts.
- Creation of inspector accounts.
- Creation of accounts for administrators and supervisors of the electronic complaints portal.
- Recovery and updating of passwords.
- Activation of parent accounts and confirming their relationship with their children.

c. Related to User Services:

- Formation of professional identification numbers.
- Teacher and school director mobility within the province.
- Entry and exit for teachers and school directors within the province.
- Employment of graduates from higher schools.
- Recruitment competitions.
- Hiring teachers as contractors.
- Monitoring employees' professional progress.
- Managing employee absences.
- Extracting and downloading documents from the information system.
- Managing professional exams.

d. Related to School Structures:

- Updating information about educational institutions.
- Real-time notification system regarding heating status.
- Monitoring internet connection status.
- Monitoring the status of computer equipment.
- Geographic coordinates of educational institutions.
- Managing statistical data to support decision-making.

Afterward, the main difficulties and obstacles encountered were listed, along with proposed solutions to overcome them, which are as follows:

a. Obstacles and Difficulties:

- Slowness and instability of the information system.
- Weak infrastructure and internet bandwidth, especially in remote areas where it is almost nonexistent.
- Lack of proficiency in using the information system.
- Linking services within the information system to specific timeframes for some operations.
- Difficulty in downloading and extracting documents in the information system.
- Lack of notifications and alerts to inform users of the approaching deadlines for certain processes.
- Insufficient technical support to resolve issues users face with the information system.
- Lack of training and guidance on how to use the information system.

b. Suggestions:

- Develop infrastructure and activate the use of satellites.
- Create a position responsible for digitization in each educational institution, with full responsibility for the process.
- Incorporate digitalization into the educational curricula.
- Create a dedicated space for all employees of various categories, giving them full management authority via their designated window, while respecting the administrative hierarchy.
- Develop the information system by adding new operations and icons, simplifying administrative tasks and increasing efficiency in management.
- Establish advanced training centers in this field.
- Connect educational institutions to related or collaborating administrations via digital means.
- Create technical clubs within schools to teach programming and robotics, encouraging students to participate in digital initiatives.

Regarding the security aspect, the ministry is working on implementing the "Zero Hacked Accounts" project. A new version of the information system for the education sector is planned for release later this year, in line with the national digital transformation strategy for Algeria "2025-2030."

4. Conclusion

In recent years, Algeria has quickly worked to reform the educational system and keep up with global developments, especially since most sectors today are interconnected with modern technologies. Algeria has issued several laws and directives regarding the integration and regulation of digitalization in educational management, clearly indicating that the Ministry is moving toward full reliance on digitalization to manage its sector. From the field study we conducted, we can highlight the main results concerning the role of digitalization in improving administrative performance in the education sector, which include:

1. The services provided by digital administration are accessible to all, of high quality, and have alleviated much of the burden on service seekers, though they are still in their early stages and require further development and improvement, as they contain some technical errors and many icons are not activated.
2. The sector has gained independence in designing and developing digital solutions to meet the needs of various stakeholders, which has made the reliance on information and communication technologies more prominent, eliminating traditional management methods and shifting toward digital management.
3. Digital administration has contributed to reducing financial and time burdens on various categories within the educational system.
4. Digital administration has somewhat succeeded in reducing bureaucracy, improving employee performance, and eliminating manipulation in results, favoritism, and fraudulent practices by enabling daily monitoring of all movements and operations.
5. Digitalization has enhanced performance-monitoring mechanisms through digital systems that allow continuous tracking of processes and performance evaluation with absolute transparency.
6. Digital administration has simplified procedures, reduced time, and minimized effort, while also ensuring transparency in administrative transactions. All this has made management methods uniform in form, content, and timing, ensuring consistency and preventing

discrepancies, as well as standardizing the documents used, which facilitates information exchange and ensures data accuracy.

7. Digital administration has improved public service delivery, making it available to everyone without discrimination, and has facilitated the tasks of employees responsible for management by relieving them of many burdens through faster execution and higher quality.

8. Digital administration has brought educational institutions closer to the central administration as well as to the parents of students.

9. Digital administration provides instant access to all information and data, with a secure and confidential database. It also simplifies the archiving process and allows for smooth retrieval of old files, thus reducing effort, costs, and expenses.

10. Weak communication infrastructure, especially in semi-urban and rural areas, and a lack of electronic equipment, especially in primary schools.

11. The lack of scheduled training days for those responsible for digitalization and those overseeing it was a major obstacle initially due to the shortage of technicians in this field within educational institutions.

In light of these results, we propose a series of recommendations that we believe will have a positive impact on the potential activation of digital administration to improve functional performance in the education sector:

1. Provide the necessary financial coverage to acquire modern equipment and tools that are compatible with high-speed communication networks to enhance the speed of service delivery.

2. Accelerate the process of connecting institutions to satellites to improve internet bandwidth quality.

3. Reassess the regulations concerning the strict implementation of e-government and legislate the use of digital signatures.

4. Avoid restricting operations to specific time periods to prevent pressure and the accumulation of tasks. Speed up the resolution of digital platform issues and activate all icons, while designing a continuous monitoring system to address these problems.

5. Organize training courses for parents and social partners in educational institutions to introduce this technology and clarify how to use it, in addition to scheduling training sessions for employees on how to work with digitalization.

6. Continuously update communication systems and stay in sync with global developments in internet modernization, while providing all necessary material and human resources.

7. Ensure the security of information to protect it from hacking, misuse, and abuses committed by some officials.

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