

Digitalization of school guidance in Algeria

Dr. Sara Benbahi ¹

¹ University of Mustapha Stambouli, Mascara, Algeria. Email: sara.benbahi@univ-mascara.dz

Abstract---This study examines the experience of digitalizing school guidance within the Algerian educational system, which was effectively launched during the 2023/2024 academic year. This reform represents a qualitative step toward modernizing educational services and strengthening transparency and fairness in student orientation. The research adopts a descriptive-analytical approach to explore the field reality of this digital transition. It focuses on achievements as well as the technical and human challenges encountered during implementation. The findings indicate a clear improvement in service quality. Family satisfaction rates increased from 78% to 88%, while file processing time decreased by 80%. However, challenges related to digital infrastructure in rural areas and the existing digital divide require further investment and comprehensive training programs. Such measures are necessary to ensure the sustainability of this transformation and to extend its benefits to all geographical regions.

Keywords---school guidance, digitalization, digital transformation, national education, information system.

Introduction

In recent years, the pace of digital transformation has accelerated worldwide. This shift has affected many vital sectors, including education. In light of rapid technological developments and the growing challenges facing educational systems, digitalization has become a necessary tool to improve the quality of educational services and to promote equal opportunities among learners (UNESCO, 2023). Within this context, Algeria has engaged in an ambitious process to digitalize the national education sector. This initiative reflects a strong belief in the role of technology in building a modern and effective educational system that responds to the demands of the digital era and to the aspirations of Algerian society.

School guidance represents one of the most important areas that has benefited from this transformation in Algeria. Beginning with the 2023/2024 academic year, the Ministry of National Education launched a

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comprehensive project to fully digitalize orientation and re-orientation procedures. This initiative marks a historic turning point in the management of a sensitive sector that concerns millions of students and families each year (Zerrouki & Boumediene, 2024). Previously, traditional paper-based procedures required several weeks and raised many issues related to transparency, accuracy, and efficiency. Today, all guidance operations can be completed electronically through advanced digital platforms that ensure fairness, transparency, and significant savings in time and effort.

The importance of this study lies in its attempt to provide an in-depth academic analysis of the experience of digitalizing school guidance in Algeria. This is a recent reform that still requires further research and scholarly evaluation to assess its progress and identify its strengths and weaknesses. The study is also significant because of the large scale of the project, which covers more than 20,000 educational institutions and serves approximately nine million students (Kouadri, 2024, p. 65).

This study seeks to answer the following main research question: To what extent has Algeria succeeded in achieving the digital transformation of the school guidance system, and what are the major challenges facing this process? From this central question emerge several sub-questions:

- What is the general context and legal framework that shaped the digitalization project in the national education sector?
- What quantitative and qualitative achievements has the digital school guidance project accomplished?
- What technical and human challenges have accompanied the implementation of the digital guidance system?
- What are the future prospects for developing this project and extending its benefits?

To achieve the objectives of this study, a descriptive-analytical approach was adopted. This method relies on collecting data and information from multiple sources. These sources include official documents issued by the Ministry of National Education, field studies conducted in this area, and specialized academic references related to digital transformation in education.

The study is organized into several main sections. These include the theoretical framework and the general context of digital transformation in Algerian education, the technical structure of the school guidance information system, the achievements and results obtained, the challenges encountered, and finally the future prospects and recommendations.

1. The Theoretical Framework and the General Context of Digital Transformation in Algerian Education

1.1 Digital Transformation in Education: A Theoretical Approach

Digital transformation in education is defined as a comprehensive and integrated process that aims to incorporate modern digital technologies into all aspects of the educational system. This includes curricula, teaching methods, assessment practices, and educational administration (Zeghadi, 2023). According to the UNESCO framework issued in 2023 on the six pillars of digital transformation in education, the success of this process requires attention to six main dimensions. These are leadership and coordination, connectivity and infrastructure, cost and sustainability, capacity and culture, content and curriculum, and data and evidence (UNESCO, 2023, p. 88).

Many international studies have highlighted the importance of digital transformation in improving the quality of education and strengthening transparency and efficiency in educational systems. Through the use of Education Management Information Systems (EMIS), governments and educational institutions can collect, process, and analyze data more accurately and rapidly. This process supports informed decision-making based on reliable evidence (UNESCO IIEP, 2004). Digital transformation also contributes to reducing educational gaps between urban and rural areas, provided that adequate infrastructure is available and human resources receive sufficient training.

However, digital transformation in education is not without challenges. Several studies have pointed to the existence of the “digital divide,” which refers to inequalities in access to technology and the internet between urban and rural regions, as well as among different social groups (Li & Wang, 2025, p. 70). In the absence of effective policies to reduce this gap, such inequalities may deepen educational disparities rather than reduce them.

1.2 The Historical Context of the Digitalization of the Education Sector in Algeria

The project of digitalizing school guidance in Algeria did not emerge suddenly. It is the result of a long process of efforts aimed at modernizing the educational system and integrating technology into the learning process. This development can be divided into three main phases:

• Phase One (2008–2015): The Foundation Stage

During this period, Algeria launched its first initiatives toward digitalization in the education sector. Some schools were equipped with computers, and computer science was introduced into school curricula. The Ministry also began to show interest in developing technological infrastructure within educational institutions. A World Bank report on information and communication technologies in Algerian education referred to these initial efforts, despite the limited resources available at the time (World Bank, 2008, p. 100).

• Phase Two (2016–2022): The Expansion and Transition Stage

This stage witnessed a noticeable acceleration in digitalization. A large number of educational institutions were connected to the internet. Digital platforms were also introduced, including the “Parents’ Portal,” which allows families to monitor their children’s academic progress remotely. In addition, several administrative services were digitalized. These services included online student registration, digital grade submission, and the electronic issuance of administrative documents (Zerrouki & Boumediene, 2024).

In 2018, the Ministry launched an ambitious project to connect all educational institutions to the Algerian satellite Alcomsat-1, which was dedicated to supporting digitalization operations (Zeghadi, 2023, p. 87).

• Phase Three (2023–2026): The Comprehensive Digitalization Stage

This phase is characterized by the launch of broad and ambitious digital projects. One of the most important initiatives is the full digitalization of school orientation and re-orientation procedures. In April 2024, the Minister of National Education announced that the sector had entered an “unprecedented digital era.” This transformation includes the digitalization of pedagogical, educational, administrative, and organizational processes (We Are Tech Africa, 2024, p. 98).

It should be noted that this direction forms part of the National Digital Transformation Strategy (2024–2030) launched by the Algerian government. This strategy was implemented in accordance with presidential directives aiming to complete the first phase of digitalization by mid-2024 (Zerrouki & Boumediene, 2024, p. 100).

1.3 The Legal and Regulatory Framework

The project of digitalizing school guidance is based on a defined legal and regulatory framework. Several ministerial circulars have been issued to organize this process. Among the most important is Circular No. 96, dated 23 May 2024, which defined the organizational arrangements for the digitalization of student orientation and re-orientation for the 2023/2024 academic year (Ministry of National Education, 2024).

Another key document is Ministerial Circular No. 839 of 2024 concerning the evaluation of digital transformation in the national education sector. This circular established procedures for monitoring and continuous assessment of the digitalization process (Ministry of National Education, 2024, p. 165).

2. The Technical Structure and Architecture of the School Guidance Information System

2.1 The General Technical Architecture of the System

The school guidance information system in Algeria is based on a multi-layer architecture. This modern structure ensures flexibility, security, and scalability. It consists of four main layers:

First: Presentation Layer This layer represents the interface through which users interact directly with the system. It includes several user environments, such as the parents' portal, the guidance counselors' interface, the school principals' interface, and the dashboards used by education directorates. These interfaces were designed to ensure ease of use and accessibility for all target groups.

Second: Business Logic Layer This layer contains the algorithms and rules that govern guidance operations. It includes admission criteria for different streams and specializations, the processing of re-orientation requests, and the verification of eligibility requirements. This layer represents the core of the system, as it ensures that educational decisions are implemented automatically and accurately.

Third: Data Layer This layer includes databases that store all information related to students, their academic results, available streams and specializations, and the capacity of educational institutions. The Ministry relies on advanced relational databases that ensure data security, rapid access, and efficient processing.

Fourth: Security Layer Due to the sensitivity of personal data concerning students and families, an advanced security layer has been developed. It includes secure authentication systems, data encryption, access logs, and protection mechanisms against cyber threats.

2.2 Functional Components of the System

The system consists of several interconnected functional components:

- **Parents' Portal** This platform allows parents, representing approximately nine million potential users, to access their children's guidance results, submit re-orientation requests, and track the status of applications (Kouadri, 2024, p. 103).
- **Counselors' Platform** This platform is designed for guidance counselors, estimated at around 5,200 professionals. It enables them to enter data, examine student cases, and issue appropriate guidance recommendations (Ben Omar & Hamidi, 2025, p. 66).
- **Administrative System** This component is used by school principals, numbering approximately 20,000 administrators. It allows them to issue final decisions, print official reports, and approve orientation and re-orientation procedures (Kouadri, 2024, p. 105).
- **Dashboard System** This tool provides officials in the education directorates, across 58 directorates, with comprehensive statistics and detailed reports on guidance operations at local and provincial levels. It supports monitoring processes and strategic decision-making.

2.3 Technologies Used

The system relies on a set of modern technologies that ensure high performance, security, and compatibility with different devices. The main technologies include relational databases such as SQL Server and Oracle, interactive web applications that operate across browsers and devices, and web services that allow integration with other systems. The platform also uses secure authentication systems and analytical and reporting tools that provide dynamic Key Performance Indicators (KPIs).

3. Achievements and Results Obtained

3.1 Quantitative Achievements

The digital school guidance project in Algeria achieved significant quantitative results during its first year of implementation (2023/2024). Data related to approximately 1.75 million students were processed entirely through electronic procedures at both middle and secondary education levels. A substantial reduction in file processing time was also recorded. The average duration decreased from 12–15 days under the paper-based system to only 2–3 days within the digital system. This represents an improvement rate of about 80% (Ben Omar & Hamidi, 2025, p. 68).

Digitalization covered 100% of orientation operations for the three targeted educational levels. These include the fourth year of middle school (orientation toward common core streams), the first year of

secondary education (orientation toward different streams), and the second year of secondary education (re-orientation between streams). Re-orientation requests represented approximately 8.3% of the total number of students concerned. This percentage reflects the flexibility of the system in accommodating the preferences of both families and students.

In terms of infrastructure, around 20,000 educational institutions were connected to the internet. Approximately 30% of these institutions were connected through high-speed fiber optic networks, while the remaining institutions relied on traditional ADSL lines. In addition, about nine million students and 2.5 million employees were registered within the Ministry's unified information system (Kouadri, 2024, p. 118).

3.2 Qualitative Achievements

In addition to quantitative gains, the project achieved significant qualitative improvements. Field studies indicated a noticeable increase in satisfaction levels among service beneficiaries. Parental satisfaction rose from 78% to 88%, student satisfaction increased from 72% to 84%, guidance counselors reported a rise from 65% to 82%, and school principals' satisfaction grew from 70% to 90% (Ben Omar & Hamidi, 2025, p. 69).

Digitalization also enhanced transparency and fairness in guidance operations. The criteria used became clear to all stakeholders, and all stages of the guidance process could be accurately tracked. As a result, the rate of complaints and appeals dropped from 18% to 7%, while errors in guidance procedures decreased from 15% to 5%.

From an environmental performance perspective, digitalization significantly reduced paper consumption, from approximately 8 million sheets annually to only 500,000 sheets—a reduction exceeding 90%. This reflects the Ministry's commitment to environmental sustainability and its transition toward a "Paperless Administration" by 2029, as announced by the Algerian government (We Are Tech Africa, 2024, p. 122).

3.3 Impact on Various Dimensions of Guidance Work

An in-depth field study was conducted in the Bir El-Ater region, involving 21 school and vocational guidance counselors, to measure the impact of digitalization on different aspects of guidance work (Ben Omar & Hamidi, 2025, p. 71). The results revealed significant improvements across all evaluated areas:

- **School Information:** The rating increased from 6.2/10 to 8.7/10, a 40% improvement. Digital platforms facilitated access to information on streams and specializations and provided direct communication channels with students and parents.
- **Monitoring and Psychological Support:** The rating rose from 5.8/10 to 8.1/10. Digital tools enabled regular tracking of student cases and maintained consultation records, enhancing counselors' ability to provide appropriate psychological support.
- **Pedagogical Assessment:** The rating increased from 6.5/10 to 8.9/10. Digital diagnostic tools allowed more accurate evaluation of students' aptitudes and interests, and enabled comparison of their performance against national standards.
- **Actual Guidance:** The rating improved from 6.0/10 to 8.5/10. Accurate information systems regarding academic and career options helped counselors make more objective guidance decisions based on reliable data.

4. Technical and Human Challenges

4.1 Challenges Related to Digital Infrastructure

Despite the achievements, the digital school guidance project faces significant challenges, primarily related to digital infrastructure. A recent study on digital transformation in the national education sector indicated that 35% of educational institutions, particularly in rural and mountainous areas, suffer from weak internet connectivity (Belhouel et al., 2026, p. 155). In addition, 22% of institutions face frequent

power outages, especially in highland and southern regions of Algeria, which disrupts the use of digital platforms.

Furthermore, 18% of institutions, particularly those located in remote areas, lack modern computing equipment. In 15% of provinces with low population density, the irregular availability of technical maintenance services leads to prolonged periods of equipment downtime.

4.2 The Digital Divide Between Urban and Rural Areas

The digital divide remains one of the most significant challenges in extending the benefits of digitalization to all students and families in Algeria. There is a substantial disparity in access to technology between major cities and rural regions. According to available data, approximately 72% of families in large cities own a computer, whereas this percentage drops to only 38% in rural areas (University of Batna, 2023, p. 69). In terms of internet access, 85% of urban families are connected compared to just 45% in rural areas.

This digital gap may prevent some families, especially in rural areas, from fully benefiting from the digital school guidance platforms. Addressing this issue requires urgent interventions to provide alternatives that ensure information reaches all families, regardless of their geographic location or economic status.

4.3 Human and Training-Related Challenges

In addition to technical challenges, digitalization raises human-related issues linked to the digital skills of educational actors. Despite efforts in training, a portion of counselors and school principals still require additional preparation to use the digital platforms effectively. Data indicate that 68% of counselors and 82% of principals have received training on the new system, leaving 32% of counselors and 18% of principals without the necessary training (Ben Omar & Hamidi, 2025, p. 120).

Moreover, only 45% of parents are able to use the digital platform effectively, meaning that more than half of parents still face difficulties in interacting with digital technology. This situation necessitates awareness campaigns and simplified training programs aimed at parents, enabling them to monitor their children's guidance journey through the digital platforms.

4.4 Security Challenges and Protection of Personal Data

Protecting the personal data of students and families remains a major challenge, particularly in the absence of comprehensive personal data protection legislation in Algeria as of 2024. Limited expertise in educational cybersecurity, the risk of cyber intrusions, and low awareness regarding password and account security are all factors requiring special attention from responsible authorities (Mekroud, 2025, p. 88).

05. Future Prospects and Recommendations

5.1 Strategic Axes for Future Development

To ensure the sustainability and further development of the digitalization project, several strategic directions must be pursued:

- **Horizontal Expansion:** This includes extending the system to other educational levels, such as primary education by 2027, and linking it to higher education and vocational training platforms to provide a comprehensive view of educational and professional pathways.
- **Technical Development:** This involves integrating artificial intelligence technologies to analyze students' interests and abilities more accurately, developing mobile applications to facilitate access to services, and employing big data analytics to anticipate future trends in guidance.
- **Infrastructure Improvement:** This requires intensive investment in fiber-optic networks to cover 100% of educational institutions, providing tablets to all counselors, and establishing specialized regional maintenance centers to ensure continuity of services.

5.2 Strategic Recommendations

Based on the previous analysis of achievements and challenges, the following recommendations are proposed:

- **Infrastructure:** Priority should be given to investing in fiber-optic networks in rural and remote areas to ensure high-quality connectivity. Alternative energy solutions, such as solar power, should be provided in regions that experience frequent electricity outages.
- **Training:** Continuous and specialized training programs should be organized for all stakeholders, including counselors, administrators, and parents, to enhance their digital skills and enable optimal use of the platforms. It is also recommended to produce simple, visual training materials, such as instructional videos, especially targeted at parents.
- **Cybersecurity:** A specialized unit should be established to protect personal data and enhance cybersecurity. Clear policies and procedures must be developed to safeguard data privacy, and awareness campaigns should be conducted to emphasize the importance of digital security.
- **System Integration:** Efforts should be made to link the system with universities and vocational training institutions to provide a comprehensive view of educational and professional pathways. This integration will help students and their families make informed guidance decisions.
- **Learning from International Experiences:** Algeria can benefit from successful international experiences in educational digitalization. The Tunisian experience highlights the importance of early and continuous user training. The Moroccan experience emphasizes the value of public-private partnerships in providing infrastructure. The UAE experience stresses the need for substantial investment in cybersecurity and data protection. The South Korean experience demonstrates the potential of using artificial intelligence in career guidance.

Conclusion

The digitalization of school guidance in Algeria represents a pioneering experience in the Arab region and a strategic step toward building a modern educational system that meets the demands of the digital era. During its first year, the project successfully processed the data of millions of students with high efficiency and achieved tangible improvements in speed, accuracy, and transparency, which positively impacted beneficiary satisfaction levels.

However, this ambitious project still faces significant challenges, primarily related to digital infrastructure in rural areas, the digital divide between urban and rural regions, and the limited digital skills of some stakeholders. These challenges necessitate sustained efforts and additional investments to ensure that the benefits of digitalization reach all Algerian students and families without discrimination. The success of this project depends on three key factors: strong political will and continued governmental support; continuous training for all stakeholders to enhance their digital skills; and effective partnerships among the relevant sectors, including education, higher education, vocational training, and postal and communications services.

In the context of rapid global digital transformations, smart, data-driven school guidance has become a necessary tool for preparing future generations and ensuring that educational outcomes align with labor market requirements and national development goals. Algeria, with its human and material resources, is capable of continuing this path and achieving its ambitious objectives in educational digitalization, provided that current challenges are addressed strategically and systematically.

The journey toward a smart and fully integrated school guidance system remains long, but the initial steps have been promising and encouraging. With ongoing development and the integration of advanced technologies such as artificial intelligence and big data analytics, Algeria will be able to build a distinguished digital educational model that can serve as a regional and international reference.

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