
Digital financial Literacy and Well-being in Algeria: From Theoretical Definition to Empirical Behavioural Evidence

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Abstract:

This research investigates the impact of digital financial literacy (DFL) on financial well-being, proposing a standardized definition that synthesizes technical skills with consumer behaviour. Adopting a quantitative exploratory design, the study analyses the Algerian context through the 2025 Global Findex database.

The findings uncover a significant behavioural paradox: while the population reports high perceived financial resilience, there is a selective and cautious adoption of digital financial services. This is characterized by a preference for low-risk instruments, such as digital savings, contrasted against a deep-seated reluctance toward higher-risk digital borrowing. By focusing on the underexplored Algerian market, the study provides a vital empirical foundation for policy formulation and future academic inquiry into digital adoption within emerging economies.

Keywords: Consumer Behaviour; Financial Resilience; Fintech; Financially literate; Financial well-being.

Jel Classification Codes : F65, D14, D91

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1. Introduction:

The information technology revolution has significantly shaped economic dynamics over the past three decades, with the financial sphere emerging as a primary domain for the application of these new technologies. The advent of the internet has ushered in a wave of digital transformation, leading to countless changes through the integration of digital technologies into traditional financial services. As a result, conventional finance has been compelled to abandon its established processes and enter a new era where digitization is essential for fostering greater financial inclusion.

The adoption of new financial technologies (Fintech) has not only stimulated the innovative spirit of financial players but has also had a truly significant effect on our daily lives. Fintech offers users a multitude of options, from online banking and mobile payments to app-based investment platforms and digital marketplaces for a wide range of goods and services (Goyal & Kumar, 2020, p. 124).

The increased use of fintech has highlighted the importance of digital financial literacy (DFL), elevating it to a top priority for policymakers. Indeed, it is now recognized as a fundamental prerequisite for financial resilience and well-being. Technological advances and the growing role of technology in our daily lives have the potential to improve society's overall well-being for those who possess both access and skills (Brey, 2018, p. 42).

Financial literacy is a multidimensional concept, encompassing several elements at once. Chen and Volpe (1998, p. 108) define FL as an individual's ability to understand basic financial products and concepts, as well as the ability to effectively manage personal finances. According to Freire (1998, p. 44), digital literacy is the ability to use technology to locate, generate, analyse, and transmit information. By extension, digital financial literacy refers to an individual's ability to mobilize both financial and digital knowledge to make informed financial decisions (Alexander et al., 2016, p. 3). The Organization for Economic Co-operation and Development (2018, p. 5) has further defined key elements of DFL, including an understanding of digital financial risks, consumer rights, and avenues of redress.

The evolving needs of the 21st-century individual requires the transmission of digital skills and sound financial principles to demonstrate competence not just in conventional settings but throughout the digital frontier. Given these considerations, this research is designed to address two fundamental purposes.

First, it proposes a comprehensive and multidimensional definition of DFL that integrates the concepts of financial risks inherent in the use of digital financial services. Second, it empirically assesses the state of DFL in

Algeria, a country with limited prior research on this topic. By analysing key behavioural patterns, this study aims to address the central research question, namely:

« What is the current state of DFL in Algeria, and how is the population navigating the evolving digital financial landscape? »

Research Hypotheses:

To address the primary research question, this study tests three central hypotheses based on the proposed definition of DFL and the specificities of the Algerian market:

- **H1:** Technological expansion and smartphone access in Algeria do not automatically translate into an increase in formal digital financial skills or account ownership.
- **H2:** High levels of perceived financial resilience in Algeria are decoupled from the formal digital financial system and rely primarily on informal mechanisms.
- **H3:** The adoption of digital financial services in Algeria is characterized by a risk-aversion paradox, where digital tools are preferred for secure savings rather than for credit or borrowing.

Ultimately, this study aims to inform the development of targeted financial education and training opportunities for digitally literate users, with the goal of encouraging rational decision-making processes and fostering financial well-being for all operators in today's contemporary digital economy.

Research Methodology: This study adopts an exploratory quantitative research design, established through a theoretical-to-empirical bridge. The approach first develops a theoretical framework to propose a standardized definition of DFL that explicitly integrates the risks inherent in digital financial services. This framework is then empirically operationalized through a quantitative analysis utilizing secondary data from the World Bank Group and IFC publication, 'The Global Findex Database 2025: Connectivity and Financial Inclusion in the Digital Economy' (Klapper et al., 2025). This analysis assesses the state of DFL in Algeria between 2014 and 2024 by selecting and analysing relevant proxies from the Findex database that align with the proposed definition.

2. Theoretical framework:

2.1 Literature review:

Literature establishes a robust correlation between digital finance and DFL; consequently, a rigorous examination of the implications of financial technology (Fintech) on the broader financial ecosystem becomes imperative. Literacy in its most elementary sense refers to a certain level of instruction through the acquisition and development of reading, comprehension and expression skills. Another definition takes literacy a step

further, considering it as the relationship between the learner and his or her world (Freire, 1998, p. 130). Financial literacy is the transposition of this concept to the field of finance. Remund (2010, p. 284) considers financial literacy to refer to a person's competence in managing money. Financial literacy refers to a crucial understanding of financial concepts and the acquisition of financial skills. These skills include setting financial goals, financial planning to achieve those goals, budgeting, investing and understanding the risks involved in making specific financial decisions. It's important to note that financial education and financial decision-making are interdependent; none can substitute for the other (Kadoya & Khan, 2020, p. 535).

Financial literacy has become currently a major preoccupation; several studies confirm this general interest in financial literacy. Indeed, studies reveal a particularly low level of financial literacy in both developing and developed countries, regardless of the degree of expansion of the financial sector (Lusardi & Mitchell, 2011, p. 497). Empirical studies attest to several disparities; a large proportion of the population is generally not engaged in retirement planning, older people have a lower level of financial literacy than younger generations, and women have a lower level of financial literacy than men.

The concept of digital literacy, developed in the late 1990s, is defined in an evolutive way, due to the continuous emergence of new technologies. It is seen as engagement in a set of activities centred on digital tools and media, interactively integrated into a specific context or tasks (Meyers et al., 2013, p. 358). Digital literacy encompasses the ability to use digital services, digital communication and digital technology effectively and responsibly (Gilster, 1997, p. 1).

Digital finance, digital banking, financial technology, and fintech are regularly used interchangeably. Fintech represents a new industry that uses technology in innovative ways to transform and improve financial products and services (Schueffel, 2016, p. 45). In fact, it combines the two worlds of finance and technology, exploiting new technologies such as the cloud, artificial intelligence, blockchain, robotics, and the mobile internet to modernize traditional financial industry practices (Gomber et al., 2017, p. 540). Moreover, fintech has promoted financial inclusion, improving access to financial services for a larger population, even in areas where traditional banking infrastructure is limited or non-existent (Naoyuki et al., 2020, p. 17). Indeed, with the adoption of fintech, access has become much more flexible and convenient for individuals interested in carrying out transactions and/or activities without having to visit a physical financial institution, with just a few simple clicks on a digital device. The use of fintech products and services requires the mobilization of the necessary information on the various financial products and services available, an underlying understanding of the technology, and a general knowledge of the benefits and risks associated with the use of these digital financial

products and services. Ultimately, such knowledge constitutes the foundation of user awareness regarding these innovative financial solutions (Laforet & Li, 2005, p. 367).

DFL is a prerequisite for the effective use of digital financial services (Morgan & Long, 2020, p. 2). According to the Alliance for Financial Inclusion (2021, p. 11), digital financial services certainly confer unprecedented opportunities on consumers, such as personalized financial products and services, faster transactions, and convenient access to financial products. However, they exacerbate challenges, including the adoption of complex technology-based financial products and managing financial sophistication. Financial literacy is basic knowledge that people need (Hayati & Syofyan, 2021, p. 347). Kass-Hanna et al. (2022, p. 18) highlight the need to redefine financial literacy to include digital literacy and suggest that countries should apply a dual approach to improve both concepts to increase long-term household resilience. Setiawan et al. (2022, p. 18) found that DFL is influenced by socioeconomic background and has a positive impact on individuals' spending and saving behaviour, contributing to financial resilience. Kumar et al. (2023, p. 178) discovered that DFL serves as both a direct predictive factor and a mediator in financial decision-making.

A review of various research studies indicates that DFL is a recent and evolving concept. It is multidimensional, combining elements of both financial literacy and digital literacy. The first detailed definition of DFL was provided by Alliance for Financial Inclusion (2021), stating that:

"DFL is the accumulation of knowledge, skills, attitudes, and behaviours which, when applied in the digital financial services (DFS) environment, enable consumers to effectively use digital financial products and services to enhance their financial well-being and resilience" (AFI, 2021, p. 11).

Multiple studies have examined measures of DFL, including those conducted by (AFI, 2021, p. 11; Lyons & Kass-Hanna, 2021, p. 5; Melinda Gates Foundation, 2021, p. 8; Morgan & Long, 2020, p. 3). These studies evaluate both financial literacy and digital literacy as components of DFL.

The report titled "Financial Literacy Around the World: Insights from The Standard & Poor's Ratings Services Global Financial Literacy Survey," published in 2015, highlights that only one in three adults globally understands basic financial concepts (Klapper et al., 2025, p. 6). This means that approximately 33% of adults worldwide are financially literate, leaving around 3.5 billion adults, mostly reside in developing economies without a grasp of essential financial principles. Algeria's financial literacy situation is no different from that of other developing countries: according to the above-mentioned survey, only 33% of Algerian adults are considered financially literate (Klapper et al., 2025, p. 24). These statistics highlight the urgent need for research into financial literacy in Algeria, as no studies have been conducted on this topic, particularly regarding DFL.

2.2 Proposed Definition of Digital Financial Literacy:

While the concept of DFL has been explored in previous studies (e.g., (OECD, 2017, p. 6)), a standardized definition recognized by the international scientific community remains elusive. To address this conceptual gap, this article proposes a definition built upon two key dimensions that reflect the financial risks inherent in the use of digital financial services.

a. The skills dimension: skills are a combination of abilities to act and professional behaviours, grouped into knowledge, know-how, and interpersonal skills. This first dimension includes:

a.1 Knowledge of digital financial products & digital financial skills:

Digital financial products and services can be classified into four broad, albeit overlapping, categories:

- Electronic payments: including mobile wallets, e-money, electronic funds transfers, and digital assets (such as crypto-assets).
- Portfolio and asset management: encompassing digital banking, crypto-trading, mobile trading, personal financial management tools, online brokers, and robo-advisors.
- Alternative finance: comprising crowdfunding, peer-to-peer (P2P) lending, supply chain finance, and portfolio lending.
- Ancillary services: such as online insurance and related digital financial offerings.

Given this extensive array of choices, it is imperative for users to understand both the utility and the inherent risks associated with each specific instrument. Furthermore, individuals must recognize that digital interfaces (primarily the internet and mobile telephony) act as the essential conduits for these non-traditional financial services.

However, mere awareness of these digital offerings is insufficient. Proficiency requires the simultaneous mobilization of two distinct skill sets: financial literacy, to critically evaluate the trade-offs between the advantages and drawbacks of various products; and digital literacy, which is essential for navigating electronic media with speed and ease. Consequently, DFL emerges from the synergy of these components, representing an integrated approach that synthesizes functional knowledge of digital products with both financial and technical competencies.

a.2 Knowledge of consumer rights and redress mechanisms:

Digital financial literacy is fundamentally rooted in users' understanding of their rights and the available legal remedies should they fall victim to digital financial risks. It is imperative that users are cognizant of the formal procedures for redress and compensation in cases of fraud or financial loss, including the unauthorized

exploitation of personal data.

Furthermore, developing a robust defence against financial theft in the digital realm necessitates a comprehensive understanding of phishing tactics, common cyber-scams, and cybersecurity best practices. Consequently, it is evident that internet security awareness and fraud prevention constitute two critical aspects of DFL.

b. The behavioural dimension: This dimension describes the personal qualities required to perform a typical job, expressed at the behavioural level. These skills relate to the individual's personality and can be applied in personal or professional situations. This dimension covers:

b.1 Raising awareness of digital financial risks:

Certainly, new financial technologies have enabled a plurality of consumer choices, but they have also exacerbated the financial risks inherent in the use of the non-traditional digital financial products and services. With the increasing sophistication of digital financial products and services, individuals and businesses need to be more aware that these technological advances have brought an additional degree of risk to traditional financial products and services. In fact, it is very difficult to detect these new financial risks, given their diversification. Since the digital footprint refers to the trace of data that each user actively or passively generates while browsing the internet, it can also be a source of potential risks such as online fraud and cybersecurity.

It's important to recognize that the use of digital financial products and services can heighten users' concerns about over-indebtedness. The convenience of accessing credit through fintech platforms allows users to quickly obtain loans online, often at higher interest rates. This situation can lead to considerable financial losses, especially when retail financial service providers are unregulated or only lightly regulated. It is essential for users to fully understand the terms and conditions of the digital contracts they sign with suppliers of financial products and services. Users should be made more aware of the risks associated with digital contracts, as suppliers may use their personal information for purposes not specified in the contracts, such as advertising campaigns or assessing engagement rates.

b.2 Digital financial risks control:

Trying to avoid digital financial risks is not a real solution for limiting financial losses, since it would further reduce consumer choice. Instead, it is advisable to look at how to keep these digital financial risks under control, to minimize the probabilities of financial loss. To achieve this, consumers need to equip themselves with sufficient knowledge and understanding to identify risky financial situations.

It is therefore essential to use their financial and digital skills to navigate effectively between digital financial products and services, using computer programs and mobile applications efficiently and optimally to avoid digital fraud and choose the product and/or service that best meets their needs, without falling into

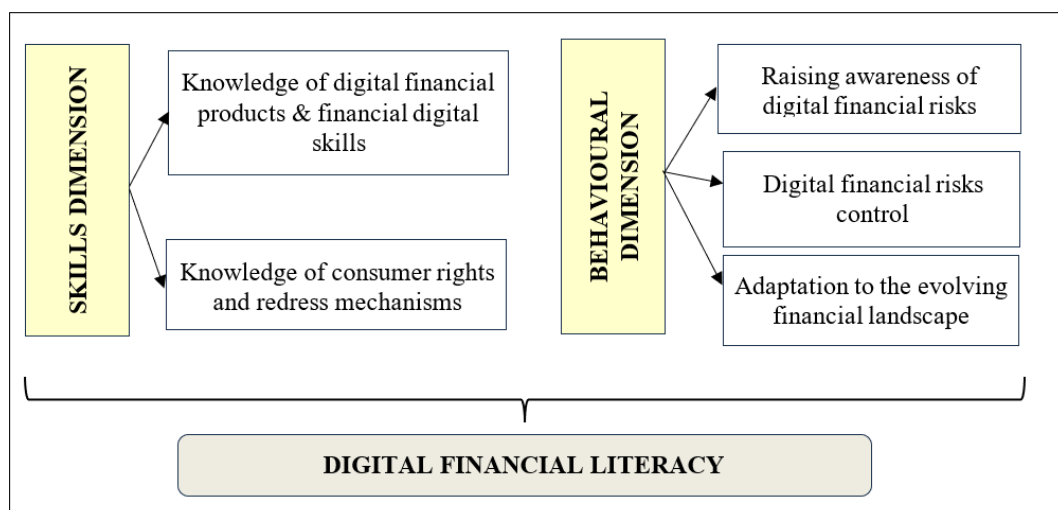
overcharging schemes. Then to find out how they can secure their personal identification number (PIN) and other personal information when using digital financial services.

b.3 Adaptation to the evolving financial landscape:

Adaptability to change is an essential aspect of DFL. It refers to an individual's ability to adjust and evolve in response to transformations in the financial landscape. This includes making informed financial decisions in an environment that is rapidly changing due to the rise of cryptocurrencies, fintech, and other digital advancements.

In the contemporary financial landscape, characterised by rapid transformations driven by the proliferation of digital finance, economic actors are compelled to perpetually adapt to technological advancements. The development of digital finance, particularly in the domains of mobile payments, online banking and cryptocurrencies, has resulted in individuals and businesses being required to adopt new technologies. This necessitates constant technological monitoring, secure online transactions and familiarisation with digital platforms. The adoption of digital finance is not merely a matter of convenience; it also opens promising prospects for effective financial management, investment and budgeting. It is therefore vital for stakeholders to be able to adapt to the digital changes in the financial landscape if they are to manage the changing financial ecosystem and reap its benefits, enabling them to achieve better financial outcomes as the financial landscape continues to develop.

Fig N⁰(01): Framework of the proposed definition



Source: Prepared by the authors.

3. Empirical Framework:

In the second part of this article, we analyse data relating to financial inclusion, which provides indirect information on DFL. The analysis presented in this article is based on the report entitled '**The Global Findex Database 2025: Connectivity and Financial Inclusion in the Digital Economy**' (Klapper et al., 2025). This

publication was produced by the World Bank Group and the International Finance Corporation (IFC).

3.1 Detailed description of the report:

The report presents the latest data from the Global Findex database (Klapper et al., 2025), which is the world's largest survey on access to and use of financial services. It measures progress in financial inclusion, focusing particularly on the influence of digital connectivity (mobile phones and the internet) on access to and use of financial services globally, especially in low- and middle-income economies.

The report is based on data from the 2024 edition of the Global Findex database, which surveyed adults in 123 countries. It compares this data with data from previous surveys (2011, 2014, 2017 and 2021) to illustrate trends and progress over time. It explores the ownership of financial accounts, the use of digital payments (for receiving salaries, merchant payments, bill payments and government payments), formal and informal savings and borrowing, financial resilience and the barriers to financial inclusion. Data is often categorised by various factors, such as gender, income, age, education and location (urban or rural), as well as geographical regions.

3.2 Empirical Data:

To provide empirical support for our theoretical definition of DFL, this section employs a quantitative analysis of data extracted from the 2025 Global Findex database (Klapper et al., 2025). The objective is to assess DFL in Algeria between 2014 and 2024 using specific proxies. This granular approach enables a focus on national dynamics, avoiding the limitations of aggregated regional-level analyses (MENA).

As DFL is a multidimensional construct, difficult to capture via a single indicator, we have adopted a proxy-based methodology. We selected indirect indicators based on their alignment with our theoretical framework, structuring them around two primary analytical axes that correlate with our proposed definition.

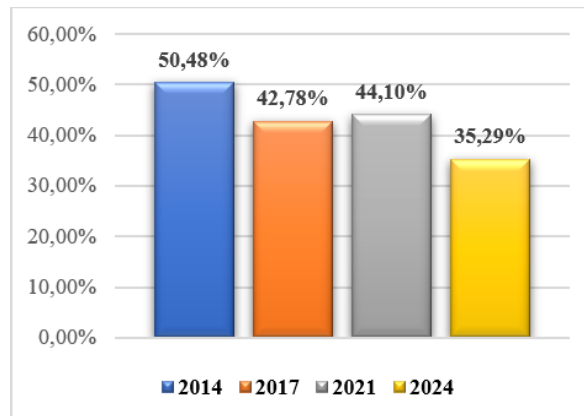
This study primarily serves as a theoretical anchoring for DFL in the Algerian context. It is important to note that while the Global Findex database provides valuable insights into connectivity and inclusion, its variables are not precisely designed to capture the multi-dimensional complexity of DFL as defined in this paper. Additionally, there is currently a significant lack of granular, micro-level data in Algeria specifically dedicated to digital financial behaviours. Consequently, a formal econometric model would be premature and potentially misleading. This research therefore prioritizes a robust descriptive and comparative analysis to identify behavioural patterns laying the necessary groundwork for future econometric inquiry when more specialized datasets become available.

3.3 Data analysis and interpretation:

a. Evolution of financial account ownership in Algeria (2014-2024):

The “account.t.d” indicator is a metric used to measure the percentage of the adult population in Algeria that has an account with a financial institution or uses a mobile money service. It encompasses both traditional financial services (banks) and digital financial services (mobile money). Having an account is the first step towards using financial services and is therefore an indication of greater knowledge of their existence and functionality.

Fig N⁰(02): Financial account ownership (%), in Algeria 2014-2024



Source: Prepared by the authors based on Global Findex Database 2025.

The statistics reveal a marked trend; there has been a general decrease in the number of individuals who possess financial accounts over the decade.

- **From 2014 to 2017:** The rate underwent a substantial decline, from 50.48% to 42.78%. This may be indicative of disengagement, a strong preference for cash or a lack of confidence in formal financial services.
- **From 2017 to 2021:** A minor recovery was observed; however, the rate remains significantly stable, at around 44%. In numerous countries, the advent of the pandemic precipitated the accelerated adoption of digital financial services, a phenomenon that was driven by the exigencies of the situation. In Algeria, this acceleration was not reflected in overall account ownership. It may be interpreted in two distinct ways:
 - The Algerian financial system may not have been adequately prepared to capitalise on the increased demand for contactless transactions.
 - The population may not have perceived digital services as a reliable solution, preferring alternative methods despite the pandemic.

This stagnation suggests that structural and behavioural barriers persist.

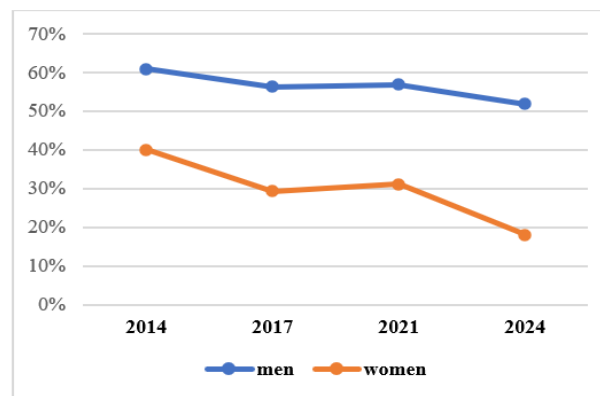
- **From 2021 to 2024:** The rate fell once more, reaching 35.29%, representing its lowest level during the period under consideration. This decline could be indicative of a return to pre-crisis habits, such as the use of cash, or dissatisfaction with the digital services that were tested during the pandemic.

The decline in account ownership indicates that the mere existence of financial services (traditional financial services 'banks' and digital financial services 'mobile money') does not guarantee their adoption. This indicates that the provision of digital financial services alone is insufficient to guarantee long-term utilisation if other factors (related to trust, behaviour and perceived relevance) remain unaddressed. This finding provides a robust empirical basis for incorporating the behavioural dimension into the proposed definition of DFL.

The existence of knowledge regarding services does not necessarily result in their widespread utilisation. This emphasises the importance of conducting an in-depth analysis of behavioural factors.

Gender analysis is necessary as it illuminates disparities in access and competencies, a pivotal component of DFL.

Fig N⁰(03): Financial account ownership by gender (%), in Algeria 2014-2024



Source: Prepared by the authors based on Global Findex Database 2025.

The figures identify a significant and increasing gender inequality.

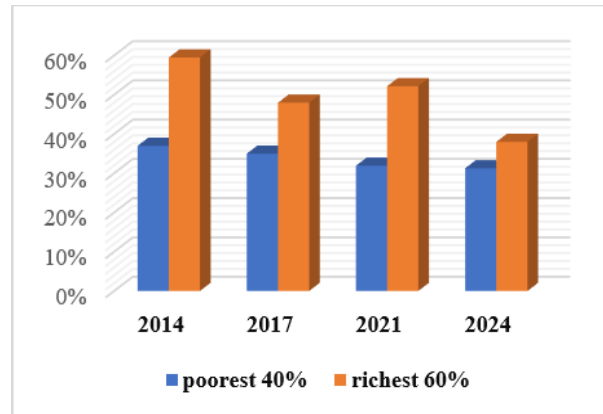
- Each year, the proportion of women with an account is significantly lower than the proportion of men with an account. In 2014, the gap was 21 percentage points (61% vs. 40%), but by 2024 it had reached 34 percentage points (52% vs. 18%).
- Account ownership rates declined for both genders during this period, but the drop was particularly alarming among women, falling from 40% in 2014 to just 18% in 2024. This suggests that achieving financial inclusion for women in Algeria is a significant challenge.
- A period of stagnation was followed by a decline. Among men, the rate remained relatively stable between 2017 and 2021, before falling. Among women, the decline was constant throughout the period.

A gender analysis shows that DFL does not affect all population segments in the same way. Women are not only less likely to have access to financial services, but this gap has also widened over time.

This suggests that efforts to promote financial inclusion must be targeted and consider the specific barriers women face.

Analysis by income level is just as crucial as analysis by gender, as it highlights social inequalities in financial literacy.

Fig N⁰(04): Financial account ownership by income (%), in Algeria 2014-2024



Source: Prepared by the authors based on Global Findex Database 2025.

The data demonstrate a clear disparity between the two income groups, a disparity that has increased over time.

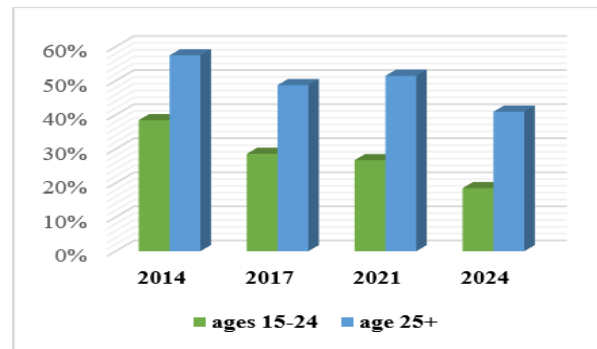
The persistent gap is a matter of concern. It is evident that the proportion of individuals in the poorest 40% of the population who are account holders is considerably lower than that of the richest 60%. This disparity is evident on an annual basis.

In 2014, the disparity was 22 percentage points (59% vs. 37%), and it remained significant throughout the period, indicating that wealth is a determining factor in access to financial services.

DFL is not distributed equitably. Not only is access lower for the poorest 40%, but the overall downward trend in account ownership also suggests broader disengagement from the formal banking system.

This supports our argument that DFL depends not only on service availability, but also on behavioural, social and economic factors that influence their adoption.

Analysis of financial account ownership by age exposes distinct dynamics that underline the challenges of financial inclusion for different generations in Algeria.

Fig N⁰(05): Financial account ownership by age (%), in Algeria 2014-2024

Source: Prepared by the authors based on Global Findex Database 2025.

The results confirm a general decline in account ownership across both age demographics; however, the decline is particularly pronounced among the younger population.

- **15-24 years old:** The proportion of young people who are account holders has decreased significantly, with a decline from 38.45% in 2014 to 18.53% in 2024. This indicates a substantial decrease in the ownership of accounts among the younger demographic. It suggests that the new generation, which should exhibit a greater degree of receptiveness to digital services, is moving away from the formal financial system.
- **Aged 25+:** Similarly, the group under discussion experienced a decline, from 57.48% to 40.94%, over the same period. However, this decline is less pronounced than that observed among young people which may be explained by a more established use of conventional banking services for professional or other transactional purposes.

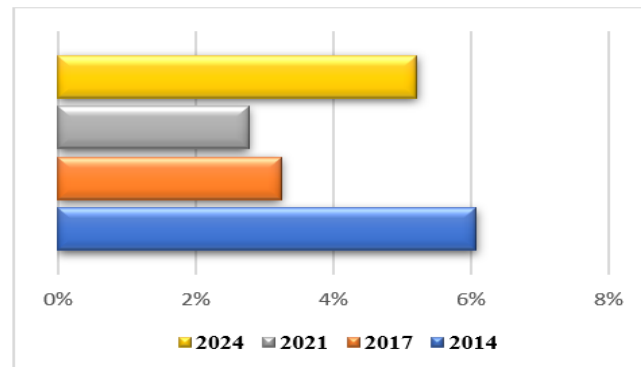
This indicates that DFL is not developing in a uniform manner across different generations. The most pronounced decline among young people is an unexpected result that contradicts the hypothesis that this generation is more inclined to adopt financial technologies.

This reinforces the significance of the definition provided, which must encompass not only access and knowledge, but also behavioural and social factors that could influence young people's disengagement.

b. Evolution of Credit Card Ownership in Algeria (2014-2024)

The variable “fin10” measures credit card ownership. It is a proxy for knowledge of financial products. The way it is used reflects how familiar the population is with digital banking services.

Fig N⁰(06): Credit Card Ownership (%), in Algeria 2014-2024



Source: Prepared by the authors based on Global Findex Database 2025.

The data demonstrate a divergent trend from that previously observed.

- **From 2014 to 2017:** The proportion of individuals who possess credit cards decreased from 6% to 3%. This decline is consistent with the overall decrease in account ownership that was also observed. The hypothesis is put forward that Algerians initially disengaged from formal financial services.
- **From 2017 to 2021:** Contrary to the previous interpretation, the COVID-19 pandemic did not have a significant effect on increasing credit card ownership. This reinforces the idea that the barriers to adoption are structural and not just behavioural.
- **From 2021 to 2024:** There is a very slight rebound to 5%, but the rate remains at a very low level.

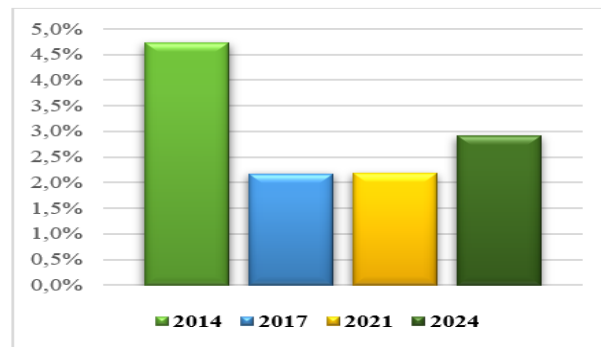
The extremely low credit card ownership rate in Algeria stands in stark contrast to the rates observed in other countries, suggesting that despite the slightly higher prevalence of bank accounts, modern digital payment methods remain marginal. This serves to reinforce the importance of the definition provided.

DFL cannot be measured exclusively by account ownership, but rather by the actual adoption of tools. the low rate of credit card ownership adoption indicates that its implementation remains very limited.

c. Trends in credit card usage in Algeria (2014–2024)

The following analysis is conducted on the variable “fin22g”. It is important for the digital skills dimension, as it quantifies the effective utilisation of credit cards, which is a practical skill.

Fig N⁰(07): Credit card usage rate (%), in Algeria 2014–2024



Source: Prepared by the authors based on Global Findex Database 2025.

The statistics indicates that credit card usage in Algeria remained very low throughout this period.

- **From 2014 to 2017:** The usage rate fell from 5.8% to 3.1%. This decline is consistent with the decrease in account ownership and credit card ownership.
- **From 2017-2024:** After 2017, the usage rate stabilised slightly, remaining at a marginal level of around 3.5–3.7%. Unlike other countries, Algeria did not experience a boom in credit card use after the onset of the pandemic.

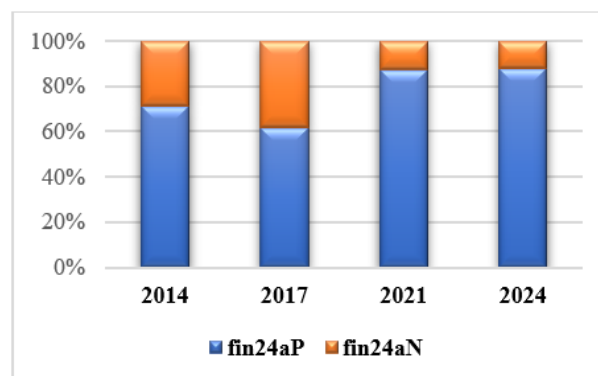
The very low rate of credit card use, a key tool in digital finance, indicates that digital financial literacy remains limited in Algeria. **This suggests that, despite the development of infrastructure, the population has not yet adopted modern payment methods.**

d. Evolution of financial resilience in Algeria (2014–2024)

Combining the analysis of variables fin24aP and fin24aN provides an accurate picture of how resilient the Algerian population is in the case of a financial shock. These variables are crucial to the behavioural dimension.

- “fin24aP”: The percentage of people who believe they can obtain emergency funds within 30 days.
- “fin24aN”: The percentage of people who believe they cannot obtain emergency funds within 30 days.

Fig N⁰(08): Financial resilience rate (%) in Algeria, 2014–2024



Source: Prepared by the authors based on Global Findex Database 2025.

Behavioural Evidence

- **From 2014 to 2017:** Contrary to a linear progression, the proportion of people who perceived that they had the ability to find emergency funds declined from 71.2% to 61.8%. This decline corresponds with the decline in account ownership and could indicate a deterioration in the economic climate or public confidence during this period.
- **From 2017 to 2024:** After 2017, the situation improved considerably. The percentage of resilient individuals increased to 87.8% by 2024, while the proportion of vulnerable individuals fell to 12.2%. Despite the low rate of access to banking services, this sharp increase is a key finding.

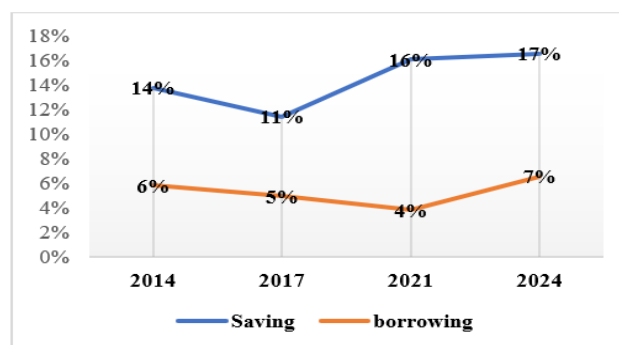
The results demonstrate that the financial resilience of the population can improve even without formal financial services.

This suggests that the ability to manage risk does not depend exclusively on digital financial literacy. Other factors, such as access to the informal market or family support, can play a bigger role.

e. Changes in digital saving and borrowing behaviour in Algeria (2014–2024)

The following analysis is conducted on the variable “fin17a.17a1.d” (digital saving) and “fin22a.22a1.22g.d” (digital borrowing). These variables are essential for the behavioural dimension, as they measure the digital financial habits of the population.

Fig N⁰(9): Digital saving and borrowing behaviour (%) in Algeria, 2014–2024



Source: Prepared by the authors based on Global Findex Database 2025.

The figures reveal different trends between digital saving and borrowing.

- **Digital savings:** Following an initial decline, savings via digital channels have grown significantly, increasing from 11.4% in 2017 to 16.6% in 2024. This suggests that the population is gradually adapting to using digital tools to manage their savings.

- **Digital borrowing:** The rate of borrowing via digital channels remained low throughout the period, peaking at 6.5% in 2024. In fact, there was a decline between 2014 and 2021. This may indicate mistrust of digital credit services or a preference for informal channels.

Analysis of financial behaviour in Algeria, using variables digital savings and digital borrowing, reveals a dynamic that diverges from the typical models observed in developed countries.

In advanced economies, the growth of DFL is often characterised by strong adoption of the two pillars of digital finance: savings and credit. Consumers actively use digital platforms for account management, automated savings, consumer loans and investment. In Algeria, the data suggest a more cautious and asymmetrical adoption pattern. On the one hand, there has been notable growth in digital savings behaviour, which increased significantly during the period. This trend may reflect a preference for saving and managing finances on digital platforms, which are perceived as safer and more accessible.

On the other hand, digital borrowing behaviour remains marginal and low. This low adoption could indicate a persistent mistrust of formal and digital credit, or a strong dependence on informal channels.

This discrepancy shows that the adoption of digital financial tools in Algeria is not uniform. The population is more inclined to use these tools for behaviours perceived as less risky (saving) but remains very reluctant to use them for behaviours perceived as riskier (borrowing).

This analysis corroborates the importance of the proposed definition, which emphasises behaviour as a factor distinct from mere knowledge or technical skills.

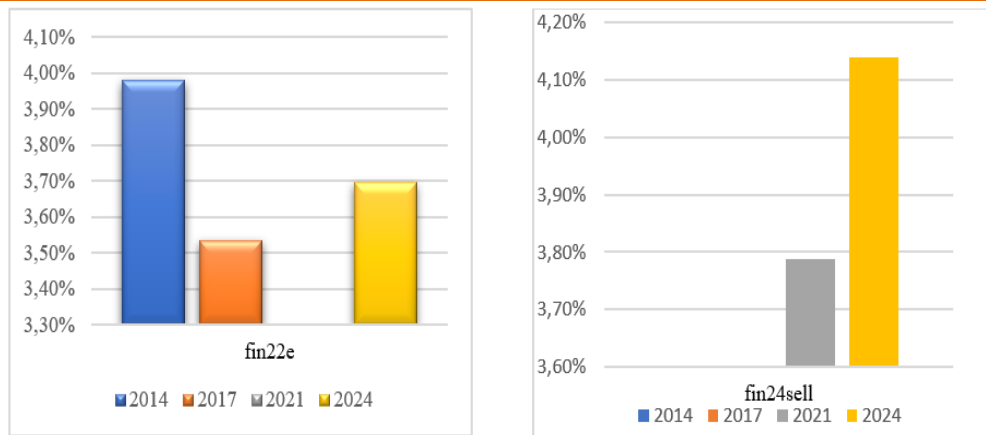
f. Analysis of adaptation behaviours in Algeria (2014–2024)

An analysis of the fin24sell and fin22e variables reveals how the Algerian population is adapting to new economic and financial realities.

- “fin24sell”: The percentage of people who believe they can obtain emergency funds by selling assets.
- “fin22e”: The percentage of people who have borrowed money for a business venture.

Fig N⁰(10): Adaptation behaviours in Algeria (%), 2014–2024

Behavioural Evidence



Source: Prepared by the authors based on Global Findex Database 2025.

The statistics show that behaviours adapted to the digital financial landscape are very rare in Algeria.

- **Business loans (fin22e):** The business loan rate remained stable at a very low level, around 3.5% to 4% over the period. This suggests that the population does not use the formal financial system for entrepreneurial purposes. This finding is consistent with the low digital borrowing rate we observed previously.
- **Sale of assets in case of emergency (fin24sell):** The use of asset sales for emergencies is also very low, with a rate of around 4% between 2021 and 2024. This behaviour, which could involve digital platforms, remains marginal.

Despite increasing digitalisation, the Algerian population has not yet fully adopted behaviours adapted to the new economic realities. The low use of entrepreneurial borrowing and asset sales for emergencies indicates a dependence on traditional, informal methods and state aid such as ANADE (formerly ANSEJ), an Algerian government aid programme designed to encourage entrepreneurship among young people.

Despite the possession of knowledge and skills, the process of adapting to and taking risks via digital channels remains a significant challenge.

To synthesize these findings, the table below provides a systematic mapping of the analysed proxies against the core dimensions of our Digital Financial Literacy framework, illustrating the alignment between empirical data and theoretical constructs.

Table N°1: Operationalization of the proposed DFL definition through Global Findex proxies

DFL Dimension	Theoretical Sub-pillar	Findex Variable(s)	Role in the Algerian Context
Technical skills	Foundational access	account.t.d	Measures the entry point into the formal digital ecosystem.

	Operational mastery	fin10 & fin22g	Evaluates practical usage of payment tools (Credit Cards).
Behavioural responses	Financial resilience	fin24aP & fin24aN	Assesses perceived capacity to manage shocks (Formal vs. Informal).
	Risk management	fin17a.17a1.d & fin22a.22g.d	Identifies the Safety Paradox (Preference for digital savings over borrowing).
	Adaptive capacity	fin24sell & fin22e	Measures advanced integration of digital finance (Asset liquidation/Entrepreneurship).

Source: Prepared by the authors

4. Results and discussion

The analysis of the Global Findex survey data, spanning the period from 2014 to 2024, was conducted to assess the state of DFL in Algeria. These results are framed within an integrated definition aligned with the multidimensional framework of Lyons and Kass-Hanna (2021, p. 5), which synthesizes the dimensions of technical skills and behavioural responses to the inherent risks of digital financial services.

5.1-Skills dimension results:

This dimension evaluates the ability of individuals to use financial and digital knowledge to interact with digital financial products and services.

- **Knowledge of digital financial products and services:** An analysis of variables related to account ownership (account.t.d) and credit card penetration (fin10, fin22g) reveals profoundly limited adoption and awareness. The account ownership rate has experienced a steady decline, falling from 50.48% in 2014 to 35.29% in 2024. This trend contradicts the global baseline established by Klapper et al.(2015, p. 24), which situated Algeria at 33% for traditional literacy, suggesting that the technological expansion of the last decade has failed to dismantle structural barriers. Most notably, among the youth (ages 15–24), the rate collapsed from 38.45% to 18.53%. This result invalidates the assumption of natural adoption by "digital natives" and underscores the urgent need to redefine financial literacy to incorporate dimensions of autonomy, as advocated by Kumar et al. (2023, p. 178). The observed collapse of account ownership among youth (from 38.45% to 18.53%) despite high technological connectivity firmly confirms *H1*, proving that digital natives do not naturally transition into digital financial natives without targeted educational interventions.
- **Digital financial skills:** The marginality of credit card usage (remaining between 3% and 6%) indicates a deficit in practical competencies. In accordance with the approach of Morgan and Long (2020, p. 3), DFL cannot manifest without the convergence of technical usage and financial management. In the Algerian context, smartphone access does not translate into the mastery of banking tools, confirming that DFL remains the absent mediator between digital infrastructure and financial decision-making.

- **Knowledge of consumer rights and redress mechanisms:** The absence of a direct proxy in the Findex database regarding "knowledge of redress procedures" constitutes a significant research gap. As highlighted by the OECD (2017, p. 6), digitalization introduces fraud risks that necessitate enhanced consumer protection. This lack of international data confirms that current metrics focus primarily on basic access, neglecting the resilience and security pillars supported by the AFI (2021, p. 11).

5.2- Behavioural dimension results:

This dimension measures the attitudes and choices individuals make when faced with the opportunities and risks associated with digital financial services.

- **Awareness and control of digital financial risks:** An analysis of digital savings (fin17a) and financial resilience (fin24aP/N) reveals a highly selective and cautious approach. Although the capacity to mobilize emergency funds surged from 61.8% to 87.8%, this resilience is decoupled from the formal system. It relies instead on informal solidarity mechanisms, echoing the necessity of a "dual approach" (technical and financial) suggested by Kass-Hanna et al. (2022, p. 2) to ensure long-term resilience. This surge in perceived resilience (from 61.8% to 87.8%) contrasted with the low utilization of formal digital tools strongly supports *H2*, highlighting that financial resilience in Algeria remains primarily decoupled from the formal system and relies on social and informal solidarity. The contrast between the growth in digital savings (11.4% to 16.6%) and the stagnation of borrowing (6.5%) illustrates a marked risk aversion. Algerians appear to utilize digital tools to sanctify savings (security) while avoiding debt obligations, confirming that the socio-economic environment heavily influences behaviours, as observed by Setiawan et al. (2022, p. 18). The clear preference for digital savings (16.6%) over the stagnation of borrowing (6.5%) validates *H3*, illustrating a risk-aversion paradox where Algerian consumers selectively adopt digital tools for financial security while avoiding debt-related risks.
- **Adaptation to the evolving financial landscape:** Advanced adaptive behaviours, such as selling assets for emergencies or borrowing for business purpose, remain marginal at approximately 4%. These data confirm that the population has yet to integrate the opportunities of digital finance to mitigate shocks or fund entrepreneurship, preferring traditional information-processing methods consistent with the theories of Freire (1998, p. 44).

In summary, digital financial literacy in Algeria is characterized by restricted skills and selective adoption. The coexistence of high financial resilience with low formal tool utilization validates the proposed definition: DFL is not merely a matter of access but resides in the capacity and willingness to manage risk,

thereby shaping behaviours that extend far beyond the mere technical availability of services. Overall, the empirical evidence gathered from the 2014-2024 Global Findex data provides a consistent validation of the three research hypotheses, reinforcing the study's theoretical framework.

5. Conclusion:

The rise of the digital economy has established Digital Financial Literacy (DFL) as a fundamental prerequisite for financial well-being, placing it at the forefront of global policy agendas. While the essential roles of governments and financial institutions in expanding access to digital financial services are well-recognized, a significant gap persists. Existing financial education strategies often prove insufficient, either by neglecting the digital dimension entirely or by treating it as a marginal component of traditional financial concepts. This underscores a critical need for a more targeted and coordinated policy approach, particularly in developing economies where the digital leap is most transformative.

Our empirical analysis of the Algerian context provides a compelling case study that corroborates this theoretical need. The results reveal a striking paradox: despite a high level of perceived financial resilience among the population, there is a selective and cautious adoption of digital financial services. Individuals are inclined to adopt low-risk behaviours, such as saving, while remaining reluctant to engage in more complex or risky actions, such as formal borrowing or entrepreneurial activities. This finding highlights the critical gap between the theoretical availability of digital services and their actual behavioural integration.

Based on these findings, we strongly recommend the urgent development of national and international strategies that address these specific behavioural challenges. To effectively improve DFL, governments and relevant stakeholders must:

1. Formally recognize the importance of financial education through national legislation and establish a coordinating body to ensure a cohesive approach among all stakeholders.
2. Develop a clear roadmap with specific, predetermined goals to guide the implementation of financial education programs.
3. Design and implement programs that specifically target the most vulnerable social groups, including the elderly, those with less formal education, and, critically, owners of small and medium-sized enterprises (SMEs) and start-ups. These programs must be tailored to address the reluctance to engage in higher-risk activities like formal borrowing and business financing.

4. Support strong regulation of financial service providers, such as fintech companies, by requiring them to better disclose product information and risks to the public. This is crucial for building trust and encouraging more complex financial behaviours.

Given Algeria's economic reliance on hydrocarbons, high youth unemployment, and the prevailing preference for informal financial channels, we recommend the following strategic actions:

1. Given the sharp decline in account ownership among young people (15-24 years), educational campaigns must be launched in schools and universities. These programs should focus on practical financial skills, such as saving and budgeting through digital platforms, to reverse this trend.
2. The government and financial institutions must design incentive programs to encourage "high-risk" behaviours, such as digital borrowing and business financing. This could include partnerships with fintech companies to offer low-interest loans for start-ups or to simplify the process of selling assets via digital platforms.
3. Our findings show a persistent gender gap in account ownership. Specific initiatives must be implemented to empower women, for example, by creating training programs on digital financial tools in collaboration with women's associations and local organizations.
4. To counter the reliance on informal mechanisms and to build trust, awareness campaigns must be launched to highlight the benefits and security of formal and digital financial services. These campaigns should focus on the transparency and regulatory protections offered by these services, thereby addressing the perceived risks.
5. Establish partnerships between financial institutions, telecommunications providers, and local communities to improve connectivity and access to digital financial services, especially in rural areas, while considering cultural specificities.

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