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Impact of digital financial literacy on individual's experience of digital payment adoption: The case of Türkiye

Mohamed Cherif El Amri^{a,*} , Mustafa Omar Mohammed^b, Ayman Mohammad Bekiroğlu^c ^a Istanbul Sabahattin Zaim University, Istanbul, Türkiye^b Alqasimia University, Sharjah, United Arab Emirates^c Ibn Haldun University, Istanbul, Türkiye

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ABSTRACT

Türkiye's digital finance landscape has experienced substantial growth in recent years, with a surge in digital banking, mobile apps, and non-cash transactions. Yet, the literature has largely remained silent on the factors contributing to digital financial literacy in Türkiye. The purpose of the present study is to investigate the relationship between digital finance literacy and individual experience of digital payment adoption. It has employed a quantitative approach using an online questionnaire survey through Whatsapp groups registered in Türkiye. The analysis of three hundred and twenty useable questionnaires collected through convenience sampling was done using SPSS, and AMOS version 25 - a Structural Equation Modelling (SEM) technique. The results suggested positive relationships between personal experience and access to financial services, beliefs about digital financial services, and safety measures of digital financial services. The study's findings provide interesting insights of the progress of digital finance literacy in Türkiye.

1. Introduction

Digital Financial Literacy (DFL), which is the ability to understand and safely use digital financial tools, has become a vital enabler of financial inclusion and effective participation in the digital economy. Unlike traditional financial literacy, DFL combines financial concepts with digital skills such as navigating mobile banking apps, verifying payment security, and understanding data privacy (Adnan et al., 2023; OECD, 2024). Studies show that individuals with stronger DFL are more likely to use digital payments confidently, manage risks, and achieve better financial outcomes (Almanaseer et al., 2024; Lo Prete, 2022).

Despite rapid global FinTech growth, evidence suggests asymmetrical adoption, especially among vulnerable groups. In Türkiye, this paradox is particularly visible. While digital infrastructures have expanded significantly, adoption remains uneven (El Amri et al., 2024). Cash still dominates everyday transactions, and digital payment use lags especially among older adults, women, and lower-income groups (Bilici & Çevik, 2022; World Bank Group, 2021). Research indicates that this gap may stem in part from low levels of financial and digital literacy, but there is little empirical data mapping this connection.

The reviewed literature reveals three important gaps. Firstly,

measurement of DFL is still in its infancy (Adnan et al., 2023); there are few standardized tools internationally, and Türkiye has not been covered in large-scale DFL assessments (OECD, 2024). Secondly, subgroup analyses are missing—little is known about which socio-demographic groups are DFL-proficient or DFL-poor, and how literacy influences use of e-wallets, mobile banking, or new payment apps. Although research like Coskun et al. (2022) analyses adoption factors, it focuses on the Technology Acceptance Model (TAM) rather than individuals' knowledge or skills. Thirdly, intervention studies are absent, leaving policymakers without evidence of what works to improve DFL in the Turkish context.

This study addresses these gaps by providing one of the first empirical mappings of DFL and digital payment behavior in Türkiye. Specifically, it (i) measures DFL levels across diverse demographic groups, (ii) links DFL to digital payment adoption behaviors, and (iii) highlights policy-relevant implications for financial inclusion. The contribution lies in moving beyond theoretical discussions to offer contextualized empirical evidence that can guide both researchers and practitioners.

Accordingly, this study seeks to achieve the following three objectives:

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* Corresponding author.

E-mail addresses: mohamed.amri@izu.edu.tr (M.C. El Amri), momar@alqasimia.ac.ae (M. Omar Mohammed), ayman.bekiroglu@ihu.edu.tr (A.M. Bekiroğlu).

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1. Investigate digital payment adoption in Türkiye and related challenges.
2. Assess DFL levels across diverse socio-demographic groups.
3. Examine the relationship between DFL and individual's digital payment experiences.

The study is structured into five sections. Following this introduction, Section 2 reviews the extant literature on pertinent issues related to digital financial literacy and digital payment adoption in Türkiye. Section 3 presents the research methodology, including an “Empirical Setting” paragraph outlining Türkiye's payment landscape. Section 4 discusses the findings and empirical analysis, and Section 5 concludes the study.

2. Literature review

Mobile financial services (MFS) have been the subject of extensive scholarly attention. [Shaikh et al. \(2023\)](#) reviewed 115 empirical studies on mobile banking, mobile payments, and mobile money, organizing the field through a Theory–Construct–Method–Moderator (TCMM) framework. Their review highlights that most MFS research concentrates on adoption drivers such as trust, perceived usefulness, and service quality, with limited focus on individual capability factors. Methodologically, the field remains dominated by survey-based, cross-sectional studies, with relatively little integration of diverse theoretical perspectives and paying relatively little attention to whether individuals have the necessary skills and knowledge to safely and effectively use these services.

Against this backdrop, DFL emerges as a critical but underexplored factor, linking the extensive research on MFS to individuals' ability to use them responsibly. DFL is generally defined as a convergence of financial literacy and digital skills. According to the OECD, it is “a combination of knowledge, skills, attitudes and behaviours necessary for individuals to be aware of and safely use digital financial services and digital technologies” ([OECD, 2024](#)). In other words, DFL encompasses both understanding financial concepts and being able to apply them via digital tools (e.g., mobile banking, e-wallets). Since today's digital complexities require knowledge beyond traditional financial literacy, several scholars describe DFL as a multidimensional concept linking financial literacy with digital literacy ([Adnan et al., 2023](#); [Rahim et al., 2024](#)). For example, [Lyons and Kass-Hanna \(2021\)](#) and [Setiawan et al. \(2022\)](#) characterize DFL in terms of knowledge, practical skills (“know-how”), and awareness (“know-about”) for digital finance. One recent review emphasizes that the massive use of digital financial services (DFS) – from online banking to mobile wallets – makes it essential to be both financially literate and digitally savvy ([Rahim et al., 2024](#)). In practice, a digitally literate consumer knows how to use digital devices ([Golden & Cordie, 2022](#)) to conduct secure transactions ([Jamnani & Jamnani, 2024](#)).

The relevance of DFL has grown alongside the rapid digitalization of finance. Global institutions highlight DFL as a priority: for instance, OECD guidance notes that as financial products go digital, strengthening digital financial literacy has become “an important component of the global policy-making agenda” ([OECD, 2024](#)). By enabling safe and informed use of FinTech, DFL supports financial inclusion and well-being. Studies find that higher DFL (or related factors) leads to greater uptake of digital tools and better financial outcomes ([Lo Prete, 2022](#)). In the COVID-19 era, DFL was especially critical: people with stronger digital-finance skills were more likely to adapt to online payments and maintain financial resilience during lockdowns. Overall, both practitioners and researchers agree that without adequate DFL, consumers may miss out on or misuse digital payment innovations.

2.1. Determinants of DFL and digital payment adoption

Researchers have identified a variety of factors that influence

individuals' DFL and their use of digital payments. Studies on DFL determinants (mainly in education and low-income contexts) suggest that education, financial knowledge, and digital exposure all play roles. For example, [Jamnani and Jamnani \(2024\)](#) find that digital literacy is shaped by financial planning, budgeting skills, digital responsibility, digital competency, risk awareness, and even attitudes like prudence and short-term financial focus. In a student sample, factors such as formal financial education, friends' or parents' influence, and social media use were also hypothesized to positively influence DFL ([Adnan et al., 2023](#)). In short, both formal knowledge (e.g. financial courses) and informal sources (peers, media) can foster DFL. Age and life experience matter too: younger, tech-savvy individuals often show higher digital aptitude, whereas older adults may lag in DFL unless actively educated.

Digital skills in general—like ICT proficiency and comfort with online services—naturally bolster DFL. [Lo Prete \(2022\)](#) shows across countries that the use of digital payment tools is closely associated with higher digital literacy, even at all levels of financial literacy. Conversely, basic financial literacy (understanding of interest, inflation, risk) underpins informed use of digital finance. Thus, many studies argue that digital and financial literacy reinforce each other: strong digital skills enable adoption of FinTech, while solid financial understanding helps use those tools wisely ([Lo Prete, 2022](#)).

Beyond literacy itself, technology-related factors influence digital payment use. In Türkiye, [Coskun et al. \(2022\)](#) applied TAM and found that perceived usefulness and ease of use, trust and integrity, and personal innovativeness all positively affect online payment adoption. In their Turkish banking customer survey, higher income and being employed (or self-employed) also boosted adoption. In contrast, perceived risk and older age had negative effects on actual digital payment use ([Coskun et al., 2022](#)). These findings align with broader trends: consumers adopt new payment methods when they find them convenient, trustworthy and relevant to their needs, but they hold back if they fear fraud or are unfamiliar with the technology. In summary, determinants of digital payments include a mix of individual traits (literacy, trust, age, income) and service attributes (ease of use, security).

2.2. Evidence from türkiye

In Türkiye specifically, emerging evidence suggests a mixed picture: digital financial services are growing, but literacy and usage gaps remain ([El Amri et al., 2024](#)). Nationwide surveys indicate that traditional financial literacy is low – only about 7 percent of households in Türkiye answered basic financial questions correctly ([Bilici & Çevik, 2022](#)). Correspondingly, cash continues to dominate retail payments: for example, Central Bank of the Republic of Türkiye (CBRT) data show that 89 percent of daily point-of-sale transactions are made in cash ([Bilici & Çevik, 2022](#)), especially small purchases (over 90 percent of transactions under 20 TL). This high cash usage suggests limited penetration of digital payments for routine spending.

On the other hand, Türkiye has made strides in account ownership and fintech access. The 2021 Global Findex country brief for Türkiye reports that about two-thirds of adults with bank accounts use those accounts for digital payments ([World Bank Group, 2021](#)). The report indicates that 68 percent of adults in Türkiye now use their accounts to make or receive digital payments, a figure comparable to that of peer economies. Notably, gaps persist: men are about 6 percentage points more likely than women to use accounts for digital payments, and wealthier adults similarly outpace poorer ones ([World Bank Group, 2021](#)). These gender and income divide underscore that digital finance uptake still lags among vulnerable groups. The Findex brief also notes that roughly 35 percent of adults in Türkiye first opened an account to receive a wage or government transfer, highlighting how digitized government-to-person (G2P) payments have driven financial inclusion.

Empirical studies further clarify these dynamics. Utilizing the 2020 CBRT's Methods of Payment Survey, [Bilici and Çevik \(2022\)](#) found that financially literate respondents were more likely to own credit/debit

cards and to switch to contactless payments during the pandemic. In other words, even in Türkiye's cash-heavy environment, those with higher literacy were ready to go cashless. Cross-country analyses also highlight Türkiye's context: [Lo Prete \(2022\)](#) shows that when digital literacy is higher in a population, usage of digital payments tends to rise, implying that Türkiye's growth in smartphone and internet access, manifested in over 88 percent internet penetration ([Kemp, 2025](#)), could support more adoption if literacy improves.

On DFL specifically, research about Türkiye is only beginning to emerge. One recent survey of foreign tourists found that higher DFL significantly increased their use of financial technology services, and that social media usage amplified this effect ([Ahmetoğulları, 2024](#)). This suggests that digitally active groups in Türkiye may convert literacy into FinTech usage more readily. However, published studies focusing explicitly on digital financial literacy in Türkiye are scarce. Most literature instead addresses general financial literacy (e.g. CBRT reports) or FinTech adoption in broad terms. A handful of academic works touch on related issues (e.g. [Durna and Aksoy \(2023\)](#) on e-commerce, or [Aydın and Sumer \(2023\)](#) on the moderating role of financial literacy on the relationship between self-control and financial security), but systematic data on Türkiye's DFL levels or its behavioural effects, especially related to payment, remain limited.

2.3. Research framework

The research framework of the present study is shown in [Fig. 1](#) below. The framework is developed based on the review of the literature and discussion of the four variables used in the study. Further discussion on the variables and hypotheses developed appears in [subsection 3.3](#) of the methodology section.

3. Methodology

Türkiye's payment landscape has rapidly modernized in recent years, with a surge in digital banking, mobile apps, and non-cash transactions. For example, formal financial account ownership reached about 74 percent of adults by 2021 ([Asli et al., 2022](#)), while the number of active digital banking users—individual and corporate—rose from 35 million in 2017 to about 91 million by 2022 ([Güz & Poyraz, 2024](#)). Digital wallets, QR codes, and contactless cards are increasingly popular: usage of e-wallets jumped from under 5 percent in 2017 to over 10 percent in 2023 ([Research and Markets, 2025](#)), and by early 2025, roughly 92 percent of the population had an active mobile connection ([Kemp, 2025](#)).

However, despite this robust infrastructure, adoption remains uneven. Cash continues to dominate everyday transactions, and usage lags especially among older adults, women, and lower-income groups ([Bilici & Çevik, 2022](#); [World Bank Group, 2021](#)). This paradox—advanced infrastructure but uneven adoption—highlights the importance of

understanding the role of digital financial literacy (DFL) in shaping financial behaviours in Türkiye.

The research method has been selected to achieve the objectives of the study, as suggested by [Creswell \(2009\)](#). Therefore, the study has adopted a critical review of the extant literature to achieve objective 1, and a quantitative questionnaire survey to achieve objectives 2 and 3.

3.1. Research instrument

The research instrument is in the form of a survey questionnaire. The researchers benefited from [Sekaran \(2003\)](#) to develop the research instrument. The Survey instrument was structured into three sections comprising a total of 39 statements measuring the perception of the respondents on their knowledge and various issues related to digital financial literacy in Türkiye. Section A comprised 10 statements soliciting information on the respondent's profiles. Section B consists of 7 statements seeking information on the general knowledge of the respondents related to digital finance literacy. This section is based on the 5-point Likert scale rated on five response alternatives, namely 'Never' (5), 'Rarely' (4), 'Sometimes' (3), 'Often' (2) and 'very Often' (1). Since the respondents are from the public, 5-point Likert scale was used to collect better quality of data ([Weijters et al., 2010](#); [Revilla et al., 2013](#)). Section C, which comprises 22 statements were also designed based on the 5-point Likert scale rated on five response alternatives, namely 'Strongly Agree' (5), 'Agree' (4), 'Slightly Agree' (3), 'Disagree' (2) and 'Strongly Disagree' (1). This section solicited the opinions of the respondents on pertinent factors determining digital financial literacy in the context of Türkiye. These factors, including those in Section B, are categorized into four variables, namely Personal Experience, Access to Digital Financial Services, Beliefs about Digital Financial Services, and Safety Measures of Digital Financial Services.

3.2. Sample size, sampling and data collection

The study has relied on online population registered in the various targeted WhatsApp groups who are believed to be familiar and exposed to the digital payment system in Türkiye. The target sample was set at 400 to be selected through convenience sampling method. The data were collected online from 5th to May 25, 2025. A total of 320 questionnaires were received as valid and complete, thereby yielding a response rate of 80% from the targeted 400 respondents. The data collected were coded and tabulated using IBM Statistical Package for Social Sciences (SPSS) version 25. The data analysis was conducted via IBM SPSS and AMOS version 25. Frequencies and percentages were generated to describe the profiles of the respondents. Meanwhile, the analysis from AMOS shows the results of data screening, normality test, collinearity test, reliability and validity test, and model fit test related to structural equation model, among others.

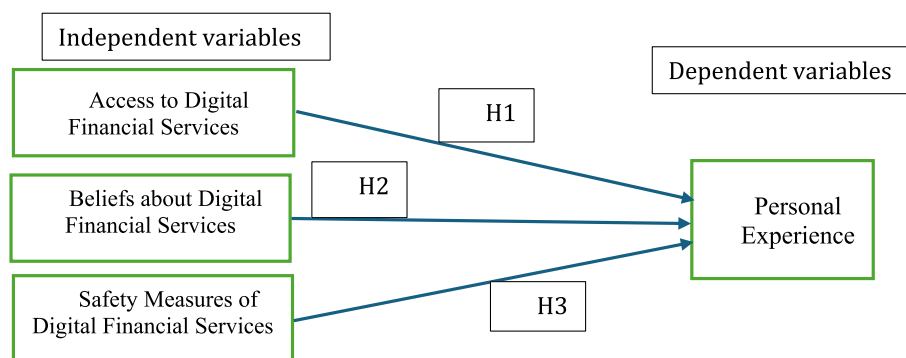


Fig. 1. Research framework. (Source: Authors' illustration)

3.3. Variables and hypotheses

3.3.1. Variables used in the study

Four variables are used for the present study, namely Personal Experience (dependent variable), and the following three independent variables: Access to Financial Services, Beliefs about Digital Financial Services, and Safety Measures of Digital Services.

The construct 'Personal Experience' represents an individual's prior exposure and familiarity with digital financial services – essentially their hands-on experience. Five statements/items were used to measure this variable. The items measure factors such as how long or how frequently the respondent has used DFS, or how many types of DFS they have tried. Examples might be "Years since I first used online banking," "Frequency of making digital payments per month," "Number of different digital financial apps I use," or "Confidence from having used DFS extensively." In the DFL literature, experience (behavior) is often viewed as an outcome or a component of capability. For instance, Lyons and Kass-Hanna (2021) describe "behavioural habits" in using DFS. While the researchers found fewer published scales explicitly for "experience," adoption studies often regard prior usage as a key variable. For example, IT adoption models treat "experience with technology" as an antecedent to attitudes and intention (though none of the provided references give specific items for this). The following are the five items included in measuring the variable:

- a) "I have used mobile/internet banking for more than 1 year,"
- b) "I make digital payments (online or mobile) multiple times per month,"
- c) "I feel very familiar with online financial transactions due to my past use,"
- d) "I have successfully completed various DFS tasks (e.g., payments, transfers) on my own,"
- e) "Digital payments have become routine in my life."

The goal is to capture how well-versed the person already is. Though not widely cited in the provided sources, it aligns with the general notion of *DFL as a skill/behavior* (Lyons et al.'s "practical behavior").

Another construct or variable is 'Access to Digital Finance Services'. It reflects an individual's access to (and use of) formal financial services, an aspect of financial inclusion. It covers whether and how people have accounts or products that allow them to transact and save. Items in this variable include questions on owning a bank account, a mobile-money or e-wallet account, having savings or credit facilities, and possibly use of insurance or digital credit. For example, items might be "I have an active bank savings account," "I have used a mobile money payment service," or "I have a credit card." Such items echo common financial-inclusion measures: Güz and Poyraz (2024) used Global Findex indicators like account ownership, mobile-money account, savings, and borrowing for households in Türkiye. The access items in this study also gauge formal/DFS access, though possibly emphasizing digital channels.

The following are the six items included in measuring the variable:

- a) "I make payments using Credit card/Debit card and Prepaid cards,"
- b) "I have access to mobile money and E-wallet for financial transactions,"
- c) "I use Bank Transfer/Internet/Online Banking for my transactions,"
- d) "I pay my bills online,"
- e) "I use mobile applications and/or online stores to buy goods and services online,"
- f) "I paid for goods and services in a physical shop with a mobile phone (e.g., using a QR code or mobile wallet such as Apple Pay, Metropol, etc ...)."

In the context of Structural Equation Modelling (SEM) adopted in this study, the variable is a reflective indicator of an underlying "access" factor. This is defensible if it is assumed a latent propensity to engage

with formal finance. Overall, it is suitable for SEM provided the factor structure is validated.

The third variable is 'Beliefs about Digital Financial Services'. It represents respondents' attitudes and perceptions toward DFS – essentially, their beliefs about the usefulness, trustworthiness, convenience, and reliability of DFS. Items in this variable capture perceptions such as "Digital financial services are useful to me," "I trust digital banking to keep my money safe," "Online payments are secure," "DFS are easy to use," or "I am comfortable learning new digital payment tools." These mirror the "attitude" or "trust" components often discussed in the technology-adoption literature. For example, Lyons and Kass-Hanna (2021) note that DFL includes attitudes and behaviours around using and Golden and Cordie (2022) emphasize that digital financial knowledge enables informed decisions and risk management, implying beliefs shape usage.

The following are the six items included in measuring the variable:

- a) "I believe digital finance keeps costs down for individuals and businesses,"
- b) "Digital finance makes it easier for people to make and receive payments,"
- c) "Digital finance is risky for ordinary people who are not familiar with it,"
- d) "Digital finance has a positive impact on the economy, society and environment,"
- e) "I believe digital finance is the system of the future."

If respondents feel positively about DFS, all belief items should move together, yielding a single factor of "positive belief" or "trust/valence" in DFS. Existing research supports treating attitudes about technology as reflective constructs. Unidimensionality should hold if all items tap the same underlying mindset. Overall, a single "beliefs" construct is plausible. Cronbach's α should again be checked. This construct fits SEM well as a latent variable influencing usage.

This fourth variable is 'Safety Measures of Digital Financial Services'. It covers the protective behaviours and precautions a person uses when engaging with DFS – essentially their security habits. Items in this variable ask about concrete actions: for example, "I regularly update my banking app's password," "I verify transactions on my phone after each use," "I never share my one-time password (OTP) with others," "I use antivirus software/secure connections when online," etc. It may also include knowledge items like "I know how to recognize a phishing attempt." In line with the DFL literature, this maps to *digital financial risk awareness/control*. For instance, Lyons and Kass-Hanna (2021) and AFI guidelines highlight understanding and preventing risk as a key DFL dimension, and Golden and Cordie (2022) underscore that DFL helps individuals manage online financial risks. In the Malaysian study by Aydın & Sümer (2024), "digital financial risk control knowledge" was critical for actual DFS use. Our safety items operationalize that concept. Similarly, Jamnani and Jamnani (2024) identify "risk awareness" as a distinct factor in DFL (and note behaviours like OTP-sharing are age-related).

The following are the six items included in measuring the variable:

- a) "I keep a record of pin numbers or passwords for my financial services,"
- b) "I often change the passwords of my mobile financial and payment applications,"
- c) "I use a banking app or online money management tool to monitor my spending and saving,"
- d) "I check to ensure that a website is secure before entering payment details,"
- e) "I am always alert and cautious about online scams and phishing attacks,"
- f) "I believe digital payment is well regulated like banks to ensure safety and security."

This variable is reflective of security consciousness. Individuals who are cautious in one aspect (e.g., never sharing OTPs) tend to be cautious in others, so the items should correlate. They are expected to form a single “safety measure” factor. Cronbach's Alpha should be assessed (good designs of such scales often exceed 0.7). Unidimensionality is likely: they all measure “security mindset.” In some models, safety items might appear as formative or separate “risk factors,” but for SEM a reflective approach is valid since these habits reflect an underlying cautiousness. Overall, the safety construct is suitable for SEM, capturing a distinct facet of DFL (risk management). This is consistent with practice.

3.3.2. Hypotheses developed for the study

The hypotheses for this study are based on the theory of TAM, originally proposed by Davis (1989). TAM provides a widely accepted theoretical foundation for understanding users' adoption and experiences with new technologies. Accordingly, individuals' perceptions of ease of use and usefulness determine their attitudes, behavioural intentions, and ultimately their experience and actual usage of a given system. Moreover, external variables such as contextual or system-specific factors can shape these perceptions and thereby influencing the overall experience. TAM is considered the most effective technique for predicting human behaviour towards technology adoption (Marangunic & Granic, 2015).

Building on TAM, this study conceptualizes “Personal Experience with digital financial services” as the dependent variable, explained by three external factors: “Access to Digital Finance Services”, “Beliefs about Digital Financial Services”, and “Safety Measures of Digital Financial Services”.

- **Access to Digital Finance Services** reflects the degree to which individuals can easily obtain and use digital financial platforms. In TAM terms, this relates to *facilitating conditions* and *ease of use*, as better access enhances users' ability to engage effectively with the system, thereby shaping their personal experience.
- **Beliefs about Digital Financial Services** represent users' cognitive evaluations of the usefulness, convenience, and relevance of these services. This variable aligns closely with *perceived usefulness* in TAM, which is a central determinant of attitudes and experiences. Strong positive beliefs are expected to translate into more favourable personal experiences.
- **Safety Measures of Digital Financial Services** capture users' perceptions of the adequacy of security protocols, fraud protection, and privacy safeguards. Prior extensions of TAM (such as TAM2 and Unified Theory of Acceptance and Use of Technology (UTAUT)) highlight the role of *trust* and *perceived risk* in technology acceptance. Strong safety measures reduce perceived risk, increase trust, and thus contribute positively to user experience.

The expansion of digital financial services has significantly altered individuals' interactions with financial systems by improving convenience, efficiency, and accessibility. Digital financial services—including mobile and internet banking, fintech platforms, and electronic payments—play a key role in enhancing financial inclusion and shaping users' everyday financial experiences (Demirgüç-Kunt et al., 2018). Greater access to these services enables individuals to conduct transactions more easily and independently, thereby influencing their overall personal financial experience.

Technology adoption theories, such as TAM and UTAUT, emphasize that direct user experience with digital systems enhances perceived usefulness and ease of use, leading to more positive user outcomes (Davis, 1989; Venkatesh et al., 2003). Empirical studies confirm that increased access to digital finance improves user satisfaction, trust, and engagement with financial services (Liébana-Cabanillas et al., 2020).

In Türkiye, rapid digitalization of the banking sector, high mobile penetration, and growing fintech adoption have transformed personal

financial experiences. Evidence suggests that individuals with greater access to digital financial services report higher engagement and more favourable financial experiences (Aksoy & Abdulfatai, 2019; CBRT, 2022). Accordingly, improved access to digital financial services is expected to positively influence personal experience. Consequently, the following hypothesis is formulated:

H1. There is a positive relationship between Access to Digital Financial Services and Personal Experience in the context of Türkiye.

Beliefs about digital financial services—such as perceptions of usefulness, ease of use, security, and trustworthiness—play a central role in shaping individuals' interactions with financial technologies. Foundational technology adoption theories, including TAM and UTAUT, posit that users' beliefs strongly influence their experiences, attitudes, and behavioural outcomes when engaging with digital systems (Davis, 1986; Venkatesh et al., 2003). Positive beliefs reduce perceived risk and uncertainty, thereby enhancing users' confidence and satisfaction during financial transactions.

Empirical research in digital banking and fintech demonstrates that favourable beliefs regarding reliability, data security, and service quality are positively associated with better user experiences and higher satisfaction levels (Liébana-Cabanillas et al., 2020; Oliveira et al., 2014). Conversely, negative beliefs—particularly concerns related to privacy and fraud—tend to undermine personal experience and limit effective engagement with digital finance (Gefen et al., 2003).

In Türkiye, where digital banking adoption has accelerated alongside increasing fintech innovation, beliefs about digital financial services have become critical determinants of user experience. Studies on Turkish consumers indicate that trust, perceived usefulness, and perceived security significantly shape individuals' financial experiences and satisfaction with digital banking platforms (Aksoy & Abdulfatai, 2019; CBRT, 2022). Accordingly, positive beliefs about digital financial services are expected to enhance personal experience. Therefore, the following hypothesis is formulated:

H2. There is a positive relationship between Beliefs about Digital Financial Services and Personal Experience in the context of Türkiye.

Safety measures are a critical determinant of users' experience with digital financial services, as financial transactions inherently involve risk, privacy concerns, and trust. Digital safety measures—such as authentication protocols, encryption, fraud detection systems, and data protection mechanisms—play a central role in shaping individuals' confidence and comfort when using digital financial platforms. According to technology adoption and trust-based models, perceived security and system reliability positively influence user experience by reducing uncertainty and perceived risk (Gefen et al., 2003; Venkatesh et al., 2003).

Empirical studies in digital banking and fintech consistently demonstrate that strong safety and security features enhance customer satisfaction and improve overall user experience (Liébana-Cabanillas et al., 2020; Oliveira et al., 2014). Conversely, inadequate security measures or fear of cyber threats negatively affect users' personal experience and discourage sustained engagement with digital financial services (Kim et al., 2010). Effective safety mechanisms therefore serve not only as technical safeguards but also as psychological assurances that foster positive user interactions.

In Türkiye, the rapid growth of digital banking and fintech services has heightened consumer awareness of cybersecurity and data protection. Regulatory oversight and enhanced security standards introduced by financial authorities have reinforced users' trust and experience with digital financial platforms (CBRT, 2022; Aksoy & Abdulfatai, 2019). As such, stronger safety measures are expected to improve individuals' personal experience with digital financial services. Accordingly, the following hypothesis is formulated:

H3. There is a positive relationship between Safety Measures of Digital

Financial Services and Personal Experience in the context of Türkiye.

4. Results and analysis

This section presents the findings and analysis of the quantitative data which were collected to achieve the second and third objectives of the study. The subsequent subsection 4.1 presents descriptive statistics of frequency distributions related to the profiles of the respondents, followed by the presentation about their general knowledge of digital financial literacy in subsection 4.2. Subsection 4.3 provides the results and analysis of the variables.

4.1. Profiles of the respondents

As previously mentioned, a total of 320 questionnaires were received as valid. The respondents were classified by gender, age, marital status, education level, occupation, monthly income, monthly expenditure, monthly savings, usage of digital payment, and level of digital financial awareness. Tables 1–3 below show the profiles of the respondents.

Based on Table 1 above, most of the respondents 55.3% were male, and 44.7% were female. Just under forty two percent (41.6%) of the respondents were aged 15 – 29, almost thirty percent (29.4%) were aged 30 – 44, and only 3.4% of the respondents were above 60 years old. Majority of the respondents (55%) were single and 43.1% were married.

Meanwhile the results reported in Table 1 also show that the education levels were diverse. All the respondents had some form of academic qualification. The majority (53.1%) completed tertiary education, bachelor's degree, 19.4% obtained master's degree, and 15.9% of the respondents earned doctoral degree. Meanwhile most of the respondents (28.1%) were housewives and a combined percentage of 32% are

Table 1
Profiles of the respondents by gender, age, marital status, education level, and occupation.

Characteristics	Category	Frequency	Percentage
Gender	Male	177	55.3
	female	143	44.7
Total		320	100
Age Group	15 – 29	133	41.6
	30 – 44	94	29.4
	45 – 59	82	25.6
	60 and above	11	3.4
Total		320	100
Marital Status	Married	138	43.1
	Single	176	55.0
	Divorced/Widowed	4	1.3
	Other	2	0.6
Total		320	100
Education Level	Primary School	5	1.6
	High school	17	5.3
	Diploma	15	4.7
	Bachelor's degree	170	53.1
	Master's degree	62	19.4
	PhD	51	15.9
Total		320	100
Occupation	Student	74	23.1
	Teacher	35	10.9
	Manager in private sector	41	12.8
	Government civil servant	27	8.4
	Self-employed.	27	8.4
	Businessperson.	16	5.0
	Farmer	10	3.1
	Housewife	90	28.1
	Others	74	23.1
Total		320	100

(Source: Authors' illustration)

Table 2
Profiles of the respondents by monthly income, expenditure, and savings.

Characteristics	Category	Frequency	Percentage
Monthly Income	Below 1000	83	25.9
	1001 - 2000	98	30.6
	2001- 3000	58	18.1
	Above 3000	81	25.3
Total		176	100
Monthly Expenditure	Below 1000	107	33.4
	1001 - 2000	69	21.6
	2001- 3000	61	19.1
	Above 3000	83	25.9
Total		320	100
Monthly Savings	Below 500	199	62.2
	501 - 1000	70	21.9
	1001- 1500	27	8.4
	Above 1500	24	7.5
Total		320	100

(Source: Authors' illustration)

Table 3
Profiles of the respondents by usage of digital payment, and level of digital financial awareness.

Characteristics	Category	Frequency	Percentage
Have you used digital payment?	Only made digital payments	109	34.1
	Only received digital payments	4	1.3
	made and received digital payments.	168	52.5
	Did not make or receive digital payments.	39	12.2
Total		320	100
What is your level of awareness of digital finance?	Very high	34	10.6
	High	71	22.2
	Medium	141	44.1
	Low	53	16.6
	Very low	21	6.6
Total		320	100

(Source: Authors' illustration)

employed as teachers, managers in the private sector and government civil servants. As most of the respondents had a high level of academic qualification, it is expected that they will provide reliable and well-informed responses.

Table 2 above shows that 30.6% of the respondents earn monthly income between USD1001 to 2000, and above 25% each earn below USD1000 and above USD3000. Meanwhile, most of the respondents (33.4%) spend less than USD1000 monthly. Furthermore, 62.2% of the respondents could save below USD500 monthly. Therefore, the opinions expressed in the survey are highly influenced by the single middle-aged male respondents who are highly educated and earning above USD1000 monthly.

Table 3 above shows that most of the respondents, 52.5%, made and received payments using digital platforms and services, and 44.1% have a medium level of awareness on digital finance, though quite a substantial percentage of 22.2% have a high level of digital financial awareness.

4.2. General knowledge of the respondents on digital finance

As discussed in the methodology section, Section B of the questionnaire, used to solicit information on the general knowledge of the

respondents, was designed based on the 5-point Likert scale rated on five response alternatives, namely 'Never' (1), 'Rarely' (2), 'Sometimes' (3), 'Often' (4) and 'very Often' (5). Table 4 below shows the findings of the respondents' general knowledge related to digital finance.

Based on Table 4 above, most of the respondents, 62.2%, have acknowledged that they have very often used tablets, laptops, or desktop computers in the last 12 months, and 82.8% have declared that they have very often used smartphones and mobile phones in the last 12 months. Meanwhile 20.9% and 20.3% of the respondents have acknowledged that they have sometimes and very often respectively used devices such as smart watch and smart TV in the last 12 months. On the other hand, 45.3% of the respondents have declared that they have very often sent or received emails in the last 12 months. Similarly, 54.7% of the respondents have acknowledged that they have very often used a mobile phone to make a normal call or video call in the last 12 months. Another relatively high percentage (78.1%) of the respondents opine that they have very often used instant messaging applications (like WhatsApp) in the last 12 months. In contrast, 44.7% of the respondents have confirmed that they do not need help from relatives or friends to use digital technologies, indicating their vast abilities in managing digital finance.

4.3. Results and analysis of the variables

This subsection presents results of data screening tests for inconsistencies, missing data and assumptions for normality and multicollinearity. The subsection also presents the findings from Exploratory Factor Analysis, Reliability and Validity Tests, and Structural Equation Modelling.

4.3.1. Data screening

The data collected from the 320 respondents was checked for inconsistencies for all the variable items by running descriptive statistics in SPSS. No inconsistencies were found. The analysis also showed no

Table 4
General knowledge of the respondents on digital finance.

No	Statements	Frequency/(Percentage)				
		1	2	3	4	5
1	How often have you used tablets, laptops, or desktop computers in the last 12 months	9 (2.8)	17 (5.3)	27 (8.4)	68 (21.3)	199 (62.2)
2	How often have you used smartphones and mobile phones in the last 12 months	0	1 (0.3)	4 (1.3)	50 (15.6)	256 (82.8)
3	How often have you used other devices such as smart watch and smart TV in the last 12 months	65 (20.3)	46 (14.4)	67 (20.9)	47 (14.7)	95 (29.7)
4	How often have you sent or received an email in the last 12 months	5 (1.6)	33 (10.3)	63 (19.7)	74 (23.1)	145 (45.3)
5	How often have you used a mobile phone to make a normal call or video call in the last 12 months	1 (0.3)	10 (3.1)	35 (10.9)	99 (30.9)	175 (54.7)
6	How often have you used instant messaging application (like WhatsApp) in the last 12 months	2 (0.6)	2 (0.6)	2 (0.6)	64 (20.0)	250 (78.1)
7	When using digital technologies, do you need the help of relatives or friends?	143 (44.7)	112 (35.7)	45 (14.1)	5 (1.6)	15 (4.7)

(Source: Authors' illustration)

missing values in the whole data sets, meaning the 320-sample size is valid. The skewness and kurtosis distribution methods were used to determine normality test of the data. Skewness refers to the regularity of a distribution while Kurtosis refers to its homogeneity as compared to a normal distribution. The proposed guidelines by Hair et al. (2010) suggest that skewness values within ± 2 and kurtosis values within ± 7 indicate acceptable univariate normality for multivariate analysis. Furthermore, and consistent with recommendations in the structural equation modelling literature, values of skewness and kurtosis within ± 3.5 were considered indicative of no severe deviation from normality (Kline, 2011), especially in some applied SEM and PLS-SEM studies which adopt ± 3 as a more conservative threshold with larger samples. Hence, all observed values in this study fell within the acceptable thresholds of ± 3.5 , suggesting that the data adequately satisfy the assumption of normality; except for only one item (A4) which exceeded this range and therefore removed from the data sets.

Meanwhile the Common Method Variance (CMV) test using Harman's single factor analysis was conducted in SPSS on all the variable items. The results showed that a single factor accounted for 32.34 % of the total variance explained which is less than 50% and therefore satisfactory (Gaskin & Lowry, 2014). On the other hand, a test was conducted to determine whether in the data set there was a significant correlation between two variables due to Collinearity. The collinearity test was performed in SPSS using linear regression. From the variance inflation factor (VIF), it is evident that there is no collinearity issue in the data set as the VIF values are less than 5 (Hair et al., 2017).

4.3.2. Exploratory factor analysis

Factor analysis is a kind of exploratory research. It organizes comparable variables into dimensions in the same way as the cluster analysis groups similar instances. Identifying latent variables is another name for this technique. Factor analysis does not discriminate between independent and dependent variables since it is an exploratory approach. In fact, by limiting the dimensionality of the data, it decreases the information in a model. This method serves several functions. It is used to simplify data, such as in predictive regression models, by lowering the number of variables. When factor analysis is used for these objectives, the factors are usually rotated once they are extracted. There are various alternative rotation techniques for factor analysis, and some of them assure that the factors are orthogonal. When the correlation coefficient between two components is zero, multicollinearity difficulties in regression analysis are eliminated (Ather & Balasundaram, 2009).

In SPSS, after running dimension reduction on the data set, from the KMO and Bartlett's Test results, it is found that the measure of sampling adequacy is 0.891 (Table 5) which is much more than 0.6 and it means sampling is perfectly adequate.

In addition to the KMO and Bartlett's Test, the authors conducted communalities values test represented by the dimension reduction for factor analysis. From the data extracted for communalities using principal component analysis extraction methods, there was no value which is less than 0.3 and therefore all the variables are kept (Ather & Balasundaram, 2009). The dimension reduction for factor analysis also represents the values of total variance explained. It is found that 56.16 % of total variance has been explained by all the variables in the model. There were five components out of twenty-one that had Eigen values greater than 1 and the rest of the components had Eigen values less than 1. This shows that the five components could be retained for further analysis.

Table 5
KMO and Bartlett's test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.902	
Bartlett's Test of Sphericity	Approx. Chi-Square	2222.069
	df	210
	Sig.	0.000

After analysing the data in SPSS through fixed number of factors (five) and setting coefficient value less than 0.5, it is found that the component correlation matrix is orthogonal. Then, the varimax method in SPSS for analysing orthogonal matrix was selected. From the rotated component matrix, the extracted components and their corresponding variables were found as shown in Table 6 below. This is, after dropping the following items (A2, A4, A6, B2, S1, S3, S6).

4.3.3. Reliability and validity test

After extraction of factors through exploratory factor analysis, the reliability test was performed. In SPSS, Cronbach's Alpha is generally used to measure the internal consistency of questionnaires.

The Cronbach's Alpha value is greater than 0.7, which means that all the questionnaires used in the variables are reliable. Meanwhile, the composite reliability for all the variables reached the cut-off value of 0.7, which also provides a good evaluation as indicated in Table 7 below.

Regarding the validity test of the data, convergent validity and discriminant validity tests were performed. Convergent validity is good when the AVE of each concept is estimated at 0.5. (Fornell & Larcker, 1981). All variables in the model met the 0.5 cut-off estimate (Table 8). The discriminant validity test refers to the situation in which a construct's indicators are unrelated to those of another construct (Chin, 2010). Researchers have recommended using Fornell-Larcker criteria to assess discriminant validity (Henseler et al., 2016). The square root of AVE is greater than the relationships of interconnected constructs, as seen in Table 8. As a result, the discriminant validity conditions are also met. So, the reliability and validity of the data are satisfactory for further analysis.

4.3.4. Structural equation modelling

SEM is a multivariate statistical analytic tool for examining complex structural correlations between variables. This method combines component analysis with multiple regression analysis and is used to investigate the structural link between measurable and latent variables or constructs (Hair et al., 2017). SEM is a statistical modelling approach that is largely linear and cross-sectional. Special instances of SEM include factor analysis, route analysis, and regression analysis. SEM is mostly a confirmatory method rather than an exploratory one. The measurement model is the component that connects measurable and latent variables. The structural model is the portion that connects the latent variables.

4.3.4.1. Model fit. There are varieties of indicators that show how good the model fits through SEM technique. The global model fit can be done

Table 6 Rotated component matrix.^a

	Component			
	1	2	3	4
A1	0.722			
A3	0.767			
A5	0.663			
B1		0.523		
B3		0.833		
B4		0.646		
B5		0.669		
S2			0.563	
S4			0.735	
S5			0.793	
P1				0.641
P2				0.695
P3				0.745
P4				0.798
P5				0.553

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

^a Rotation converged in 9 iterations.

Table 7 Cronbach's alpha and composite reliability.

Variables	Cronbach's Alpha	Composite Reliability
Access to Financial Services (A)	0.717	0.821322
Beliefs About Digital Financial Services (B)	0.721	0.836865
Safety Measures of Digital services (S)	0.780	0.966323
Personal Experience (P)	0.794	0.916862

Table 8 AVE and Fornell-Larcker criterion.

	Average Variance Extracted (AVE)	A	B	S	P
Access to Financial Services (A)	0.536729	0.826			
Beliefs About Digital Financial Services (B)	0.524538	0.313	0.972		
Safety Measures of Digital services (S)	0.552581	0.250	0.271	0.872	
Personal Experience (P)	0.512582	0.210	0.211	0.220	0.812

in two non-exclusive ways, using inference statistics, i.e., the tests of model fit, or fit indices, an assessment of approximate model fit. Today, it is common to find out the model fit both for the measurement model and for the structural model. Here, the measurements model is reflective in nature as the relationships are measured from the constructs to their indicators.

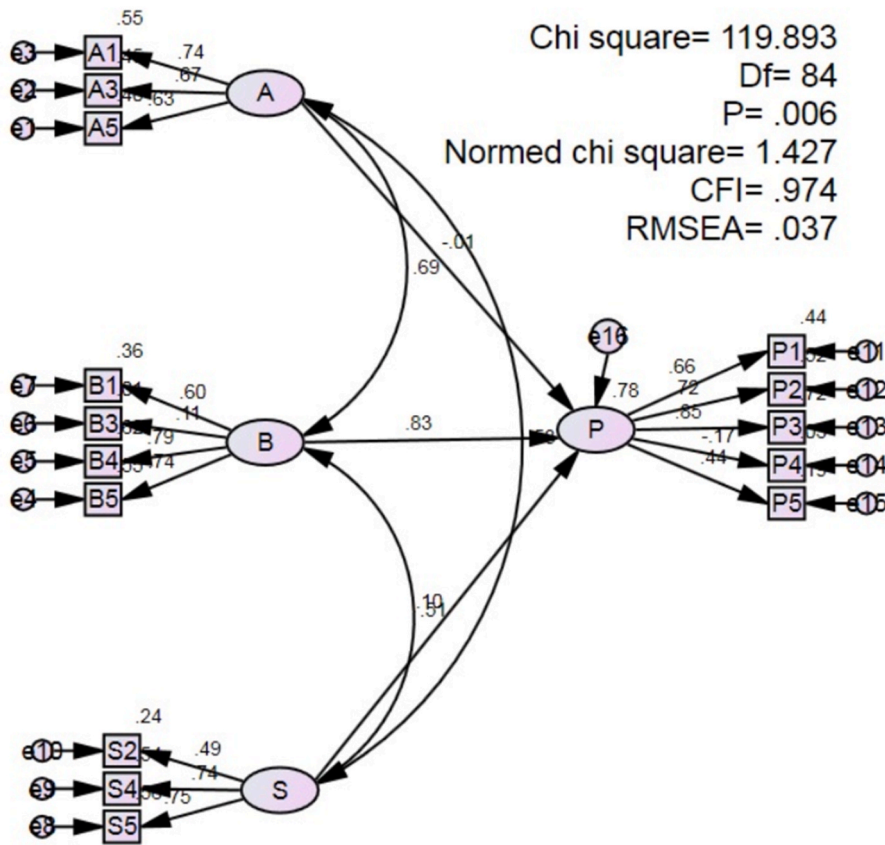
Fig. 2 below represents the structural model of this study where all the variables are pooled together. The model fits properly as the CFI and RMSEA values are found to be adequate. In this study, Chi-Square value is also used to evaluate the model fit. In AMOS, the chi-square value is called CMIN. From Fig. 2, CMIN is 119.893, RMSEA is 0.037 (which is below the 0.05 cut-off point), and CFI is 0.974 (which should be more than 0.9) support the standard threshold of fit indices. So, based on the CFI, Chi-Square and RMSEA values, the model fit is found to be good.

4.3.4.2. Path analysis. Fig. 2 above also represents the measurement model of the study. Based on the measurement model, the hypothesized path coefficients are presented in Table 9 which shows the critical ratios (CR) obtained for the model. It presents the hypothesized paths, regression weights, CR, and the p-values. The critical ratio and significance of path coefficients are used as the basis for supporting or rejecting the proposed hypotheses in this study. Therefore, it can be concluded that hypotheses H1, H2, and H3 all are supported as the CR values are 3.085, 8.835 and 3.146 respectively where the threshold is $CR \geq \pm 1.96$ and the path is significant at the 0.05 level (Hair et al., 2012). $P = (***)$ means 0.000 which is less than 0.05.

The coefficient of determination (R^2) indicates the structural model's degree of strength. Different R^2 cut-off values are utilized by researchers in various fields of study. The R^2 values of 0.02, 0.13, and 0.26 are regarded as poor, medium, and strong for business studies, respectively (Cohen, 1988). In this model the $R^2 = 0.78$ strongly represents the model's degree of strength.

4.3.4.3. Results of the hypotheses. Table 10 represents the summary of the hypotheses test results.

Based on Table 10 above, H1 denotes that access to digital financial services by individuals positively influence the outcome of their personal experience in the context of Türkiye. Similarly, H2 denotes that individual's beliefs about digital financial services positively influence the outcome of their personal experience. Finally, H3 denotes that the safety measures individuals take towards digital financial services



Chi square= 119.893
 Df= 84
 P= .006
 Normed chi square= 1.427
 CFI= .974
 RMSEA= .037

Fig. 2. Structural model.

Table 9
 Regression weights in path analysis.

Dependent Variable	Path	Independent Variable	Estimate	S.E.	C.R.	P
Personal Experience	<—	Access to Digital Financial Services	0.170	0.055	3.085	0.002
Personal Experience	<—	Beliefs about Digital Financial Services	0.643	0.073	8.835	***
Personal Experience	<—	Safety Measures of Digital Financial Services	0.145	0.046	3.146	0.002

Table 10
 Summary of hypotheses test results.

Hypothesis Statements	Findings
H1: There is a positive relationship between Access to Digital Financial Services and Personal Experience in the context of Türkiye.	Supported
H2: There is a positive relationship between Beliefs about Digital Financial Services and Personal Experience in the context of Türkiye.	Supported
H3: There is a positive relationship between Safety Measures of Digital Financial Services and Personal Experience in the context of Türkiye.	Supported

positively influence the outcome of their personal experience.

5. Theoretical contributions and managerial implications

The paper has made several salient contributions to the digital financial area of study coupled with managerial implications particularly in the context of Türkiye.

5.1. Research and theoretical contributions

This study makes several contributions to both empirical research and the theoretical development of technology adoption literature, particularly TAM. Firstly, the study makes an important research

contribution through the development, refinement, and empirical validation of context-specific measurement scales that capture four key latent constructs within the digital financial literacy domain in Türkiye: ‘Personal Experience’, ‘Access to Digital Financial Services’, ‘Beliefs about Digital Financial Services’, and ‘Safety Measures of Digital Financial Services’. These scales were subjected to rigorous exploratory factor analysis, reliability assessment (Cronbach’s Alpha and Composite Reliability), and convergent and discriminant validity testing (AVE and Fornell-Larcker criteria). The resulting constructs demonstrate strong psychometric properties. This confirms that they reliably capture the concepts they represent. Therefore, the study fills a methodological gap in the literature, where measurement of DFL and related experiential constructs remains underdeveloped and lacks cultural specificity in Türkiye.

The validated scales constitute an empirical research instrument that can benefit future scholarship. Researchers may replicate the study, apply the scales in comparative cross-country settings, or adapt them to examine related constructs such as financial well-being, digital inclusion, or sustained usage intention. Future studies can adapt them without undertaking de novo instrument development because they have undergone rigorous reliability and validity testing. Moreover, the retention of items through rotational factor analysis ensures that each construct captures a unidimensional latent structure. This achieves operational consistency across different empirical contexts.

Secondly, it extends the theoretical scope of TAM by integrating three antecedents—'Access to Digital Financial Services', 'Beliefs about Digital Financial Services', and 'Safety Measures of Digital Financial Services'—as external variables influencing 'Personal Experience'. While the original TAM emphasized perceived usefulness and perceived ease of use as predictors of behavioural intention, this study demonstrates how contextual factors—such as accessibility, beliefs, and safety—directly shape users' experiences.

Consequently, the study advances TAM by shifting the focus from adoption intentions (which dominate prior research) to post-adoption personal experience. As such, the study provides a more comprehensive view of digital financial services usage. An immediate implication is that the quality of users' experiences is a critical outcome. This shift highlights the importance of evaluating not only whether users intend to adopt digital finance, but also whether their lived experiences with such systems are positive and sustainable.

The integration of safety measures into the model contributes as well to the growing body of TAM extensions that emphasize the role of trust and perceived risk. The findings reveal that security-related factors influence both users' beliefs about digital finance and their direct personal experiences. The centrality of trust in digital finance adoption frameworks is thus reinforced.

Moreover, the study contributes context-specific evidence by applying TAM to the digital finance sector in the context of Türkiye. It tests and validates the robustness of TAM in financial technology contexts that differ from the Western and East Asian settings where TAM has been predominantly applied. This enhances the generalizability of TAM and, thus, shows its adaptability across diverse institutional and cultural environments.

5.2. Managerial implications

The findings also carry several important implications for practitioners, policymakers, and regulators involved in the development of digital financial services. Firstly, improving access to digital financial services is crucial for enhancing users' personal experiences. Financial institutions and telecom providers should prioritize expanding infrastructure, reducing technical barriers, and simplifying account registration processes to ensure that a wider population can benefit from digital finance. Secondly, the results highlight the importance of shaping positive beliefs about digital finance. Banks, fintech companies, and regulators can achieve this through awareness campaigns, financial literacy programs, and transparent communication about the benefits of digital financial services. Strengthening users' beliefs about the usefulness and convenience of digital finance is likely to improve their overall experience and foster long-term adoption.

Thirdly, the study demonstrates that safety measures are not optional but essential. Visible and reliable security features are critical to building user trust. Enhancing perceptions of safety not only reduces resistance to adoption but also ensures that users' experiences with digital finance are positive and reassuring. Fourthly, the focus on personal experience rather than mere adoption suggests that managers must look beyond initial uptake and concentrate on user retention and satisfaction. A poor experience, even after adoption, can lead to discontinuance of use. Thus, continuous monitoring of customer experience and feedback mechanisms should be integrated into digital financial strategies. Finally, the study provides useful insights for regulators and policymakers, who play a pivotal role in ensuring safe, inclusive, and trustworthy financial ecosystems. Policies that strengthen consumer protection, mandate security standards, and support digital inclusion initiatives will enhance both access and trust, ultimately improving users' experiences with digital financial services.

6. Conclusion

Türkiye's digital financial landscape continues to progress. This is

confirmed by the results of the study based on the following main themes. Firstly, the general knowledge of the respondents. Most of them have confirmed that they are familiar with the major devices used in digital finance payments, namely tablets, laptops, or desktop computers, smartphones and mobile phones, smart watch and smart TV, email, and instant messaging applications. They have acknowledged that they often use these devices in their digital transactions. Secondly, the results of the study have revealed a positive relationship between access to digital financial services and personal experience in the context of Türkiye. The respondents acknowledge they have access to credit cards, debit cards, prepaid cards, mobile money, e-wallet, internet banking, and QR code or mobile wallet such as Apple Pay, Metropol when conducting digital payment transactions. Such access has a positive impact on their personal experience in terms of the level of their satisfaction with digital finance, convenience, security, efficiency, and persuading others to adopt digital finance.

Thirdly, the findings have shown a positive relationship between beliefs about digital financial services and personal experience. The respondents have expressed their belief that digital finance keeps costs low, it facilitates for people to make and receive payments, has a positive impact on the economy, society and environment, and is the system of the future. Again, such beliefs have reflected positively on the personal experience of the respondents in relation to their level of satisfaction with digital finance, convenience, security, efficiency and persuading others to adopt digital finance. Finally, the result of the survey supports the hypothesis that there is a positive relationship between safety measures of digital financial services and personal experience in the context of Türkiye. Most of the respondents confirm that they take several safety measures when transacting digitally in financial services. Such safety measures include keeping a good record of their pin numbers or passwords, often changing these passwords in their mobile applications, using a banking app or online money management tool to monitor their spending and savings, ensuring that a website is secure before entering their payment details, that they are always alert and cautious about online scams and phishing attacks, and they are confident that the digital payment system is well regulated. These safety measures have positive impact on their personal experience dealing with digital finance.

Like all empirical studies, this research is not without limitations. Acknowledging these limitations provides opportunities for future scholars to refine and extend the findings. Firstly, the study employed a cross-sectional research design, which limits the ability to capture changes in users' perceptions and experiences over time. Personal experience with digital financial services may evolve as users become more familiar with the technology or as service providers introduce new features. Future research could adopt a longitudinal design to trace how access, beliefs, and safety measures influence personal experience across different stages of adoption. Secondly, the study relied on self-reported data, which may be subject to response biases such as social desirability or recall error. Future studies may complement survey-based data with behavioural usage data (e.g., transaction logs, app usage statistics) to provide more objective measures of digital financial service experience. Thirdly, the research focused on a specific geographical and cultural context - Türkiye. While this provides valuable contextual insights, it may also limit the generalizability of findings to other regions with different levels of financial inclusion, regulatory environments, or cultural attitudes toward digital finance. Comparative studies across multiple countries or regions could enhance the external validity of the model.

Fourthly, the conceptual framework emphasizes access, beliefs, and safety measures as determinants of personal experience. While these variables are central, other relevant factors—such as social influence, economic incentives, user trust in providers, or perceived cost-effectiveness—were not included. Future research could integrate these additional variables to provide a more holistic understanding of personal experience in digital finance. Finally, the study treated personal

experience as a unidimensional construct. However, personal experience may consist of multiple dimensions, such as satisfaction, trust, continued intention, and emotional engagement. Future scholars could explore multi-dimensional measures of experience, enabling a more nuanced understanding of how digital financial services shape user outcomes. In sum, while this study makes important theoretical and practical contributions, addressing these limitations in future research will deepen our understanding of the mechanisms through which digital financial services shape user experience and adoption.

Author contributions (CRediT taxonomy)

- **Mohamed Cherif El Amri:** Conceptualization; Writing – review & editing; Investigation; Project administration; Validation; Data collection.
- **Mustafa Omar Mohammed:** Conceptualization; Methodology; Formal analysis; Data curation; Software; Visualization.
- **Ayman Mohammad Bekiroğlu:** Conceptualization; Methodology; Writing – original draft (introduction and literature review); Validation; Data collection.

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