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The Role of Financial Literacy and Digital Literacy in Fintech Usage Among Millennials Generation: Moderating by Gender

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Abstract: The advent of the current Digital Era is intricately linked to the evolution of Financial Technology (Fintech), with recent events such as the COVID-19 pandemic significantly accelerating this progress. This rapid advancement has resulted in a widespread enhancement of digital literacy among individuals; nevertheless, there is a discernible increase in the significance of financial literacy. In Jordan, there remains a notable deficiency in Financial Literacy, accompanied by a substantial gap between Financial Literacy and Financial Inclusion. The primary objective of this research is to determine the role of financial literacy and digital literacy in influencing millennials' Fintech usage, while considering the moderating effect of gender. The research adopts a quantitative cross-sectional design. To collect the required data for this research, a survey has been conducted via a questionnaire to investigate Jordanian citizens' (Millennials) perceptions regarding the research model constructs. A sample of 463 completed the questionnaire based on their awareness of Fintech services and their ability to participate in the study. This study adopted a structural equation modelling (SEM) technique with partial least squares (PLS) as an analysis method. Findings revealed that both financial and digital literacy jointly determine the use of Fintech services. Also, the results indicated that gender did not moderate the relationships between digital literacy and financial literacy with the use of Fintech. The study contributes some recommendations and future work.

Keywords: Financial literacy; Digital literacy; Millennials; Gender; Fintech

JEL Classification: G23, O33, D14, J16

1. Introduction and Background

Recently, technology has been considered a cornerstone in performing individual or business activities. Many factors have led to the dominant position of IT, such as the continuous development in the area, the education level, and other environmental and health factors, such as COVID-19 (Awad et al., 2022; Pham, 2025). Accordingly, the expansion of IT forces financial businesses to develop new financial services and products known as FinTech, to gain competitiveness (Abubakar et al., 2017; Pratiwi & Saefullah, 2022).

FinTech, as a concept, has spread recently and is defined as "a new financial industry that applies technology to improve financial activities" (Schueffel, 2016). During the COVID pandemic, FinTech, like many other applications, has been adopted to apply social distancing by performing financial transactions electronically (Popkova et al., 2021; WHO, 2020). Nevertheless, there were some challenges that affected FinTech usage.

There have been considerable changes and growth in Jordan in the development of the FinTech industry recently. Jordan has witnessed lunching many financial and electronic payment systems (Lutfi et al., 2021). For the years 2023 to 2028, Jordan has initiated the Financial Inclusion Strategy that shows the intentions to advance the development of digital payments by helping businesses in their inception stages and to promote financial inclusion (Central Bank of Jordan, 2023). In addition, it can be seen that between the years 2018 and 2022, the various FinTech activities in Jordan have received successful funding to the total of over 246 million USD, which places

Jordan in the position of second in MENA countries (Santosdiaz, 2025). Current academic research also indicates the favourable results of FinTech developments in terms of their contribution to the financial performance of banks and financial inclusion in Jordan. Bani Atta (2025) states that the effectiveness of the FinTech developments towards banks can be significantly achieved through better operational effectiveness, better satisfaction of the customers, and improved quality of services provided in Jordanian banks. Othman (2025) indicates that FinTech can bring about financial sustainability, economic empowerment and inclusive growth.

While Jordan has made great strides in fintech and digital payments, the role of literacy has not been sufficiently investigated. Where research does exist, it either studies financial literacy or digital literacy, but few studies have looked at how these combine to affect fintech uptake for millennials. Furthermore, for the most part, there is no clarity on which literacy elements are most important, or how things like gender, moderate the effect. Thus, what is the mechanism through which literacy leads to fintech adoption? Such mechanisms remain under-specified.

2. Theoretical Framework and Literature Review

During the last decade, Accordingly, Jordan Payments and Clearing Company (JoPACC) has been created to ensure the transmission of financial transactions between and with the financial institutions as well as individuals. In addition, JoPACC has the authority to governates other FinTech applications that facilitate instant payment methods and are issued by the Central Bank of Jordan (CBJ). The CBJ, established in October 1964 (Central Bank of Jordan, 2022a), is responsible for governing the financial sector. To respond to the rapid technological advancements in the FinTech industry, a firm known as Jordan Payments and Clearing Company (JoMoPay) has been established and officially started operations on April 1, 2014 (Central Bank of Jordan, 2022b).

However, there are certain areas of difficulty that appear to still need to be addressed. The lack of appropriate financial and digital skills by way of financial and digital literacy education, and issues of uncertainty in the areas of cyber-attacks and the way in which people feel safe regarding digital systems have been brought out into emphasis in many of the recent reports (Abbassi, 2024). This indicates the need for continuous education and awareness. It has nevertheless been shown that the FinTech sector can contribute to a trend of transformative development through the whole of the financial ecosystem as it is found in Jordan, with the continuing awareness of innovation, competitive forces and inclusiveness in the field of finance (Al-Okaily et al., 2025). Additionally, even though FinTech adoption in developing countries has been discussed previously (Berradia, 2025; Hasan et al., 2024; Morgan, 2021; Singh et al., 2020), the current paper attempts to investigate factors such as financial and digital literacy that affect the usage of FinTech among the Millennial Generation.

Human behavior towards adopting and using innovations has been widely examined in several disciplines, such as information systems (IS) and other social sciences. Scientists have created their theoretical models (Davis, 1989; Douglass, 1977; Rogers, 1981; Venkatesh et al., 2003, 2012) to determine those variables that influence the adoption process. Therefore, the current paper decides to discuss other factors that have not been examined in the previous theories; however, the literature found that they have a significant effect on using systems. The factors are financial literacy and Digital Literacy (Kusumawardhani et al., 2025).

2.1 Financial Literacy

Achieving financial literacy (FL) is vital due to everyday life challenges. FL can be simply defined as the level of knowledge a person has regarding financial matters (French et al., 2021). People often need to take critical actions towards their financial decisions, which may affect the stability of their lives (Panos & Wilson, 2020). Therefore, being financially literate is a corner stone that can ensure financial stability and meet many other related financial requirements (Mudasih & Subroto, 2021).

Lusardi (2019) emphasised that financial literacy has an important role in influencing various aspects, particularly the ability to take decisions ranging from daily to long-term financial matters. Financial literacy, as defined by Purwidianti & Tubastuvi (2019), encompasses a blend of knowledge, skills, and attitudes essential for effective financial management. Echoing this sentiment, Chaidir et al. (2020) concurred that financial literacy constitutes both a skill and a source of confidence necessary for making sound financial decisions. (Setiawan & Saputra, 2020) underscored the significance of financial literacy in enhancing individuals' well-being in the future. Those who have sufficient knowledge of financial literacy, according to Nasution & Fatira (2019), possess the ability to discern information, including understanding the consequences of losses and recognising rights and obligations associated with financial obligations (Nam, 2024). This heightened financial literacy not only renders individuals more adept in navigating financial products and services (Safira et al., 2020) but also positions them to make informed decisions. Conversely, Safira et al. (2020) cautioned that individuals with low levels of financial literacy are more susceptible to deception in financial transactions, which can significantly impact their daily life decisions.

2.2 Digital Literacy

According to Techataweewan & Prasertsin (2018), digital literacy (DL) is defined as the required skills an individual should have to utilise and be conscious of information technology and media to seek, assess, create, and communicate when needed. Digital literacy is more than simply a buzzword or device-specific skill. According to Ng (2012), Mohammadyari & Singh (2015), and others, digital literacy is the mindset, capacity, and consciousness to use digital technology to appropriately access, identify, manage, analyse, develop new knowledge, and communicate with one another in digital environments. The development of digital literacy is made possible by having a different belief that can adjust to always-evolving technological requirements.

Information management, digital proficiency, ethical awareness, and other topics are all included in digital literacy. It has been suggested that having a certain amount of digital literacy is necessary to use technology for effective learning (Tang & Chaw, 2016). According to Mohammadyari & Singh (2015), to use digital technology effectively and efficiently, a person needs to possess multiple forms of literacy. This is because digital literacy necessitates both an understanding of the different types of information and an integrated understanding of these types. In other words, digital literacy is more than simply knowing how to utilise technologies or computers for a purpose. An individual must alter their abilities, values, attitudes, and behaviour to become digitally literate. Understanding instructions from an application user interface, using digital tools to re-do or construct something new, using online resources to develop new knowledge, assessing the reliability of a piece of information, and having a proper understanding of Internet ethics are all examples of tasks that can be accomplished using digital technology. While digital literacy goes beyond operational abilities, digital skills or technical literacy only concentrate on the use of technology.

Therefore, digital literacy can be defined as an individual's capability and efficacy that enable him/her to use technology at a satisfactory standard for creation, communication, collaboration, and information retrieval and evaluation in a digital society. Current research assumes that this variable (Digital Literacy) will affect the usage level of FinTech applications in Jordan.

2.3 The Conceptual Link with FinTech Adoption

Conceptually, Digital competence serves as an essential precursor for Fintech adoption, as it provides individuals with the necessary tools to engage with complex digital financial platforms safely and successfully (Islam & Khan, 2024). Those with greater digital competence display higher self-efficacy, indicating the perception of the Fintech system to be less complex and easier to use, which enhances their behavioural intention towards the adoption of such services (Yao & Wang, 2024). Financial literacy provides users with an understanding of the financial mechanisms that will allow them to assess the risk and rewards of Fintech products and service providers and make informed decisions (Raza et al., 2024). Synergistically, digital and financial literacy form an interdependent dual framework wherein digital literacy provides regulatory knowledge "how", while financial literacy provides tactical knowledge "why" and "what." This interaction decreases the physiological barriers to making the conversion from traditional satiation to Fintech services. Within the Fintech ecosystem users are now faced with marrying both of these literacies to make sure that channel security, informed decision-making, and optimised usage of digital Fintech services is conducted.

DL and FL are aligned with the fundamental characteristics of the Technology Acceptance Model (TAM). DL increases an individual's PEOU (Perceived Ease of Use) by decreasing a user's perception that using FinTech is technically difficult while increasing an individual's confidence in accessing FinTech (Islam & Khan, 2024). FL similarly strengthens an individual's PU (Perceived Usefulness) by providing individuals with the ability to understand the financial advantages and disadvantages as well as the value proposition of FinTech services (Raza et al., 2024). The relationship between these two literacies therefore provides a clearer understanding of how both contribute to FinTech adoption. DL by facilitating access to FinTech, and FL by reinforcing the value of FinTech.

2.4 Gender and FinTech

The conceptualisation of gender moderation was rooted in the theoretical background of Social Role Theory (SRT). SRT proposes that sociocultural norms shape differential patterns of technology adoption between men and women. In the Middle East context, where patriarchal structures influence historical women's economic participation and access to the digital channel (Bin-Nashwan et al., 2023), social role theory is particularly interesting to explore. Fresh empirical evidence from Jordan reveals that gender plays a significant moderating effect in the relationship of constituent parts of digital financial literacy to cashless payment adoption, with the results indicating that women show stronger significant relationships between digital financial experience and usage behaviour (Shehadeh et al., 2025). This would imply that elements of digital and financial competence by Jordanian women may allow them to do so more resolutely than their male counterparts.

3. Research Model and Hypothesis

The model of this research is developed based on two dimensions of Literacy with considering the education level and gender, age, and income as control variables. Figure1 illustrates the relationships between the research variables.

H1: Financial Literacy has a positive and significant effect on FinTech usage among the Millennial Generation in Jordan.

H2: Digital Literacy has a positive and significant effect on FinTech usage among the Millennial Generation in Jordan.

H3: Gender moderates the relationship between Financial Literacy and FinTech usage.

H4: Gender moderates the relationship between Digital Literacy and FinTech usage.

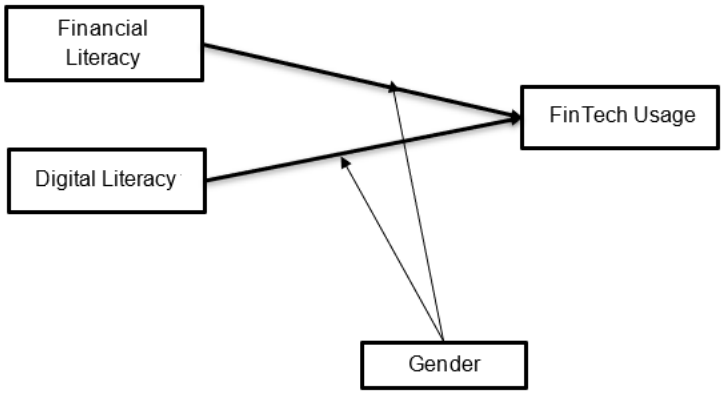

Figure 1. The proposed research model

4. Research Methodology

The current research applied a descriptive-analytical approach and a cross-sectional methodology. The population is those from the Millennial generation. Scholars and popular media assumed the early 1980s as the starting birth year and the mid-1990s to early 2000s as the ending birth years, with the generation typically being defined as people born from 1981 to 1996 (Susanto et al., 2022). Therefore, a convenient sample design has been applied and selected from Jordan.

A survey of the two-section questionnaire was developed and adopted as the main tool to collect the required data. Firstly, the survey began with a section that used to collect the demographic information, whereas the other section is structured into a five-point Likert scale (strongly agree to strongly disagree). From the first section, Gender will be used as a control variable, however; other demographic data (age, income, and education) will be used for descriptive analysis. All the items in the questionnaire were adopted from previous studies (Ng, 2012; Widyastuti et al., 2020; Zulaihati et al., 2020) (see Appendix 2).

Before conducting the major portion of the data collection, a pilot test of the survey questionnaire was completed to confirm its reliability and accuracy. An evaluation of the content validity of the instrument involved input from three qualified academics and professionals; a Full Professor from Mutah University (Finance and Banking Department), an Associate Professor from Al-Israa Private University (Accounting Department) who has had six years of experience as a Senior Specialist at the Central Bank of Jordan, and a Full Professor of Business at University of Jordan. They provided comments that assisted in refining the survey questions to be culturally relevant, clear, and aligned with the constructs being investigated in the research. Next, a pilot test of the survey was given to twenty Jordanian Millennials. Results of the pilot testing indicated acceptable levels of internal consistency among the constructs studied, with Cronbach's alpha values being greater than 0.7 for each construct. After receiving comments on the pilot testing, minor changes to the survey were made in order to improve contextually-relevant wording and understanding of the survey questions within the Jordanian culture.

Respondents are from Jordan received an online questionnaire. 482 responses were received, however, after the initial data cleaning, 19 responses were deleted, and 463 responses are valid for further analysis. A sample size of 463 respondents exceeds the required threshold sample size needed for PLS-SEM analysis as indicated by Hair et al. (2019) "10 times rule" where the minimum sample size should equal 10 times the total number of arrows pointing to a latent variable in the structural model. Since the dependent variable (fintech usage) has four arrows directed toward it (FL, DL and two interaction terms), the minimum sample size required is 40 respondents. Our sample of 463 adequately exceeds that minimum and would ensure that statistical power is sufficient for proper

parameter estimation (Hair et al., 2019). The data was analyzed using SmartPLS 4.

5. Results

In this study, the analytical approach employed is structural equation modelling (SEM) utilizing partial least squares (SMART-PLS4). SEM-PLS is strongly recommended for application in the development of theoretical frameworks and testing novel models, especially when measurements are relatively new and have not been extensively examined in existing research (Hair et al., 2019). This method demonstrates an adequate predictive capability while imposing less strict requirements on distributions, as it does not necessitate normal distribution of items in research data (Anderson & Gerbing, 1988; Chin, 1998; Hair et al., 2019). Since the objectives of the current research involve forecasting, the model, hypotheses, and measurements have not been thoroughly validated in the literature, and some items in our data deviate from a normal distribution ($p < 0.01$ based on Kolmogorov–Smirnov's test), SEM-PLS is deemed a suitable approach for our study. Testing and analyzing the defined hypotheses were conducted using SmartPLS4 software.

5.1 Measurement Model Analyses

To assess the reliability and the validity of the measurement model, various criteria, encompassing the discriminant validity, convergent validity, and indicator reliability. To begin with, indicator reliability was estimated through examining factor loading values, with a criterion set at a threshold more than 0.7 (Hair et al., 2019). According to the results generated from PLS-SEM algorithm, three items (DL1, DL4, and DL9) recorded the following values of outer loadings (0.684, 0.637, and 0.541), respectively. To enhance the results, we conducted again after deleting the item with the lowest outer loading (DL9), and then (DL4). As a result, Table 1 showed that the rest of the items, including DL1, have demonstrated factor loadings exceeding 0.7, affirming the reliability of all indicators. Concurrently, constructs' reliability was appraised by calculating Cronbach's alpha coefficients for each construct. The recommended threshold for Cronbach's alpha is stipulated to be not less than 0.70 (Hair et al., 2019; Fornell & Larcker, 1981), and the values presented in Table 1 surpass this benchmark.

Moving on to convergent validity, three distinct tests were employed: firstly, factor loading was checked and ensured they are exceeding 0.7, secondly, the analysis revealed that composite reliability (CR) was greater than 0.7, and finally, we calculated average variance extracted (AVE) for each main construct and found they are exceeding 0.50 (Hair et al., 2019). A thorough examination of Table 1 reveals that factor loading values surpass 0.7, each construct exhibits the required threshold with a CR value and AVE. Consequently, these findings fulfill the criteria for convergent validity, showcasing the strength of our model.

Table 1. Construct reliability and convergent validity

Construct	Items	Loadings	Cronbach's Alpha	CR Value	AVE
Financial literacy	FL1	0.795	0.832	0.832	0.664
	FL2	0.819			
	FL3	0.832			
	FL4	0.814			
Digital literacy	DL1	0.704	0.894	0.900	0.574
	DL10	0.749			
	DL2	0.740			
	DL3	0.751			
	DL5	0.769			
	DL6	0.793			
	DL7	0.820			
	DL8	0.729			
Fintech usage	USE1	0.887	0.866	0.867	0.788
	USE2	0.906			
	USE3	0.870			

Thirdly, discriminant validity was ascertained through the application of three distinct tests to ensure the model's constructs exhibit discernment validity. These tests comprised: Fornell-Larcker criterion, the heterotrait-monotrait ratio of correlations (HTMT), and the cross-loadings criterion. According to the Fornell-Larcker criterion, it is imperative that the square root of the Average Variance Extracted (AVE) for each construct exceeds the correlation coefficients it shares with other variables (Henseler et al., 2015). Examination of Table 2 reveals that the square root of the AVE for each construct (indicated in the diagonal and bold) surpasses the correlation coefficients with other constructs, satisfying the conditions set by the Fornell-Larcker criterion for discernment validity.

To investigate common method bias (CMB), we then conducted Harman's single-factor test and computed variance inflation factors (VIF). The results of Harman's single-factor test revealed that a single factor explained

the largest amount of variance (42.3%) but less than 50% of all variance, indicating CMB is not a serious threat (Podsakoff et al., 2003). All VIF scores were between 1.387 and 2.154, far below the conservative threshold of 3.3, indicating that multicollinearity and CMB are not a threat to the validity of the results (Kock, 2015).

The HTMT serves as a crucial metric for affirming discriminant validity. To establish this validity, it is imperative that the HTMT ratios of correlation values remain below the specified thresholds of 0.85 (Benitez et al., 2020) or 0.90 (Henseler et al., 2015). Upon examination of Table 3, it is evident that all HTMT ratios fall below the 0.85 cutoffs.

Table 2. Fornell-Larcker discriminant validity test

	DL	FL	USE
DL	**0.757**		
FL	0.622	**0.815**	
USE	0.699	0.674	**0.888**

Table 3. HTMT discriminant validity test

	DL	FL	USE
DL			
FL	0.713		
USE	0.783	0.792	

Additionally, the third criterion, the cross-loading criterion, underscores the importance of items being appropriately loaded onto their designated constructs rather than loading onto alternative constructs. An inspection of Table A1 in Appendix 1 reveals that all items included in the measurement of the study exhibit proper loading onto their respective constructs. Specifically, the loading values of each indicator with its corresponding constructs surpass the loading values with other constructs, thereby satisfying the cross-loading criterion.

The outcomes of the measurement model underscore the presence of satisfactory levels of convergent and discriminant validity for each construct within the envisaged research model of the present study. These findings provide assurance, allowing for confident progression to the subsequent tasks and the successful testing of the structural Model.

5.2 Structural Model Analyses

Table 4 and Figure 2 present the results of the path model and hypotheses testing, respectively. According to the analysis, hypotheses (H1-H2) received support, whereas H3 and H4 did not. The analysis indicates that FL ($\beta = 0.338$; $p < 0.000$) and DL ($\beta = 0.519$; $p < 0.000$) significantly enhance users' utilisation of Fintech applications, aligning hypotheses H1-H2.

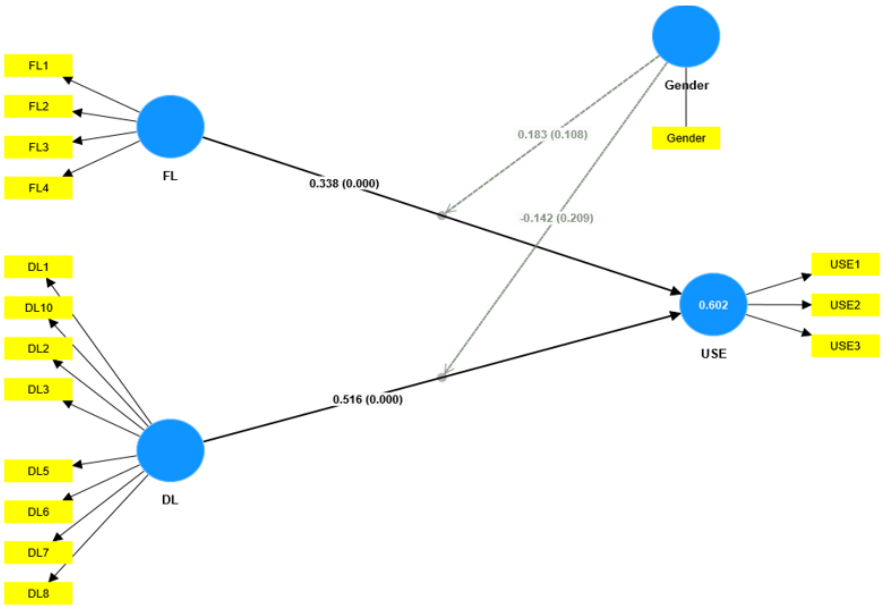

Figure 2. Results of the structural model analysis

Furthermore, the study found no moderating effect of Gender (Male:155, Female: 308) on the relationship between DL and usage (β = -0.146; p = 0.209), thereby not supporting H3. Similarly, the outcomes were statistically insignificant for Gender regarding the relationship between FL and usage (β = 0.188; p < 0.108), offering no support for H4. Collectively, the significant factors account for 60.2% (R^2 = 0.602) of the variance in Fintech usage. This R^2 value, amounting to 60.2%, can be considered relatively high, particularly in studies aiming to predict human behaviour, as is the case in our study (Hair et al., 2019). The interpretation of these results will be discussed in the following section.

Table 4. Summary of hypotheses testing

Hypotheses Path	Beta β	t-Value	*p*-Value	Result
H1: FL → USE	0.338	3.627	0.000*	Supported
H2: DL → USE	0.519	5.714	0.000*	Supported
H3: Gender x DL → USE	-0.146	1.255	0.209	Not supported
H4: Gender x FL → USE	0.188	1.609	0.108	Not supported

*$p \leq 0.001$ ** $p \leq 0.05$

6. Discussion and Implications

The findings of the PLS-SEM analysis revealed that both exogenous variables, FL and DL, have a significant positive impact on the use of Fintech applications. However, the results did not support the assumption of the differences among the sample groups based on Gender or any other demographic variables. The next paragraphs discuss the results in more detail.

Specifically, the findings indicate that DL is essential for using Fintech applications by millennials. This construct has the greatest significant impact on growing their use of such applications, which is shown by the high value of Beta (β = 0.519) and p-value 0.000. These results are in line with the literature that investigated applications related to financial services. The findings for H2 go in line with (Ullah et al., 2022). Moreover, the significance of digital literacy was found to be positive on the utilisation of cloud technology at companies (Cetindamar et al., 2021). Also, in the higher education context, digital literacy presented a positive impact and has a crucial role in the online distribution of higher education (Huong et al., 2022). Digital literacy in the E-Commerce context (Suryani et al., 2022) was also found significant and has positive correlation with e-commerce adoption. In conclusion, the findings for H1 are consistent and agree with the results of previous literature.

Secondly, financial literacy has a significant positive effect on FinTech usage among the Millennial Generation in Jordan. The analysis showed that this construction has a high Beta value (β = 0.338) and p-value (0.000). The results reveal that the perceptions of individuals' financial capabilities matter more in adopting fintech services. The results are agreed with the literature that examines and analyses the nexus between financial literacy and fintech adoption (Prabhakaran & Mynavathi, 2023). Literature has also consistently highlighted the enhanced explanatory strength of FL in understanding and the prediction of users' financial behaviours in financial applications (Ananda et al., 2023; Lind et al., 2020). In the fintech industry, individuals who generally have more confidence in financial matters tend to recognise the potential benefits more quickly, rather than exhibiting scepticism or being reluctant to adopt these technological innovations. Accordingly, individuals will have a greater willingness to adopt such service. This agrees with the findings of (Shiau et al., 2020), who confirmed a positive relationship between the usage of fintech services and financial self-efficacy.

The findings reveal that both independent variables (financial literacy, and digital literacy) interact with three co-related pillars (cognitive, behaviour and structural enablers) that cumulate describe the uptake and usage of FinTech products. From the cognitive pillar, financial literacy mediates the complexity relating to financial decision making in relation to the enhanced ability of consumers to understand their financial products used, assess the risks within and gains to be made therefrom and better enable the management of such transactions (Lusardi & Mitchell, 2014). Parallel to this, digital literacy diminishes the fear associated with technology usage and enhances the consumers' feelings of competence and confidence and ability to make use of such digital technologies (Yao & Wang, 2024). In terms of behaviour, the effects of literacy reduce further enhance the willingness of consumers to engage with such FinTech applications as these decrease the psychological barriers undertaken and other barriers are lowered in respect of experimentation, learning and habitual usage (Raza et al., 2024). Furthermore, those with best dual literacy also feel greater levels of self-efficacy in respect of transaction consummation, addressing technological problems and appraising their value associated with the benefits from usage of FinTech literacy.

At the structural level, however, barriers such as lack of accessibility, usability and recognition or legitimacy relating to FinTech one the contrary still serve to lessen inclusion outcomes (Islam & Khan, 2024). The synergy of the evidently dual-conditioned literacy in the financial and digital sphere (R^2 = 0.602) outcomes accordingly can be noted: simply, digital literacy gives the "how", ie ability to deploy the technology, finanical literacy gives the "why" and "what", i.e. understanding of the financial deployment purposes. Thus, these combines give a dual-

competences enabling environment for developmental purposes in respect of the adoption of FinTech in developing markets.

However, the findings stated there are no significant differences and no moderating for Gender on the relationships explained in H3 and H4. Therefore, the results do not support the hypotheses. These results confirm previous literature (Wagland & Taylor, 2009), which found that no such proof relating to gender differences and their impact on the level of financial literacy is available. Nevertheless, the sample of this research consists of 155 (Male) and 308 (Female), which clearly needs to be investigated in future research. The non-significant moderating role of gender stands in contradiction with Social Role Theory predictions of differing patterns of technology adoption between genders (Bin-Nashwan et al., 2023; Shehadeh et al., 2025). Several theoretical explanations arise.

Firstly, generational homogenization: There may be more homogeneity of gender egalitarian mode of technology than older cohorts had due to the digital nativity of millennials when growing up (Prensky, 2001). The finding of a non-statistically significant interaction between gender and FinTech service adoption contrasts with Shehadeh et al. (2025) who showed greater effects on women's adoption of cashless payment. It is plausible that this disparity is due to the fact that the present study included a broad array of FinTech services, as opposed to only cashless payments. Further, given the relatively low level of variability in educational attainment of females within the sample (i.e., 66.5% of the total sample had some post-secondary education or higher), there may be less variability associated with gender differences in the adoption of FinTech services. Secondly, educational homogenization: There has been a great deal of improvement in educational attainment in females within Jordan (66.5% of our sample were females) which may have equated gender opportunity for development in financial and digital competence. Thirdly, adoption by necessity: The incidents of the COVID-19 pandemic compelled total adoption of Fintech for both sexes which may have over-ridden social and cultural mores (Bani Atta, 2025) and, fourthly, threshold effects. Here, once the user (irrespective of gender) attains a certain minimum threshold of dual literacy the marginal effective moderating role of gender tends to disappear, implying this competency level even outranks the social role expectations for usage of Fintech. This is consistent with the change currently occurring in relations between genders relative to the country's progressive financial inclusion governmental policies (Central Bank of Jordan, 2023) and the implication suggest that literacy-based rather than gender-targeted policies will be found to be more effective for this cohort.

6.1 Theoretical Implications

The study contributes theoretically by investigating the interaction between financial literacy, digital literacy, and Fintech adoption among the Millennials in Jordan. The research hypothesized that both financial and digital literacy crucially affect the Fintech adoption, ensuring the importance of these factors in the current digital era. The findings enrich existing knowledge and theoretical frameworks in technology adoption by employing and investigating the roles of financial and digital literacy. Also, the results show the non-moderating effect of gender that contradicts the hypothesis, underline the need for more investigation to understand Fintech usage determinants.

6.2 Practical Implications

The implications of the current study suggest that, with respect to targeted initiatives for policy makers, fintech service providers and universities in Jordan, targeted initiatives are warranted for the development of actual and potential users of fintech. For policy makers, this implies the inclusion of financial and digital literacy training courses in school and university curricula such as in the use of digital currencies, digital payment systems and how to secure protection from misuse of these media online. Provision may be made for national training certification systems to be employed such as that outlined in the Financial Inclusion Strategy of Jordan 2023-2028 (Central Bank of Jordan, 2023), which relates literacy standards, but there would be tax incentives for training institutions awarding training to aid people even in unserved areas.

For the fintech sector, the results suggest the incorporation of examineables in training via users' experiences. This may involve layers of facilities in the applications for financial tutorials to give wider knowledge of how the platform operates, with simple and easily operated application forms for financial novices and others with high level trading capacity. Training hubs, in association with JoPACC and community partners, will allow people to know the correct ways to learn current digital literacy modes and financial literacy ways to avoid issues like students losing money in digital currency or payment system financial operations. Gamified learning types and social accolade values may encourage students to become involved that learning experience is fun, and they need keeping absorbed in subject matter.

In this respect thoughts about universities and colleges will give interesting results in what they can do. They have to be engaged in producing cross training of students in relation to technology and financial literacy and business and human behaviour training to be able to acquire connected digital literacy skills and techniques for financial literacy at the same time. Fintech incubators (Othman, 2025), which form links between students and businesses and their production systems, may produce an orientation experience for students to become aware of

points at which they may acquire skills and techniques to be able to enter what they hopefully wish to be a booming digital economy in Jordan.

7. Conclusion and Future Work

This research focus on the critical roles that financial and digital literacy have in forming the adoption of Fintech among Millennials in Jordan. The findings show that literacy levels crucially affect Fintech adoption. Gender, however, does not have a moderating impact on these relationships as it was hypothesized. Nevertheless, the research contributes to the literature on FinTech adoption and financial behavior, by providing estimable understandings for both academics and practitioners.

Potential future research opportunities could examine the specific elements of financial and digital literacy that have the most influence on the adoption process of Fintech. Moreover, involving other potential moderating variables such as the level of income and education may extend the understanding of those relationships involved. Additionally, exploring cultural aspects within Jordan could also improve the quality of findings. Finally, comparative research that addresses other generations' responses to Fintech adoption such as Gen-X and Gen-Z, might be another avenue of future research.

However in our results the indication of the non-significant moderating effect would echo the more rapidly developing sociocultural context of Jordan, where growing educational achievements by females (females comprised 66.5% of the total sample) and an increasingly progressive female financial inclusion policy may be effecting a closing of the gender disparity gap in patterns of technology adoption for the Millennial cohort followed further research into the generational shifts into gender dynamics in the context of Jordanian Fintech.

Data Availability

The data used to support the research findings are available from the corresponding author upon request.

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Conflicts of Interest

The author declares no conflict of interest.

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Appendix 1

A1:

Table A1. Items loading

	DL	FL	USE
DL1	**0.704**	0.395	0.486
DL10	**0.749**	0.584	0.68
DL2	**0.74**	0.431	0.481
DL3	**0.751**	0.509	0.509
DL5	**0.769**	0.384	0.513
DL6	**0.793**	0.465	0.522
DL7	**0.82**	0.487	0.536
DL8	**0.729**	0.476	0.446
FL1	0.473	**0.795**	0.547
FL2	0.501	**0.819**	0.52
FL3	0.497	**0.832**	0.542
FL4	0.555	**0.814**	0.584
USE1	0.643	0.601	**0.887**
USE2	0.623	0.622	**0.906**
USE3	0.596	0.571	**0.87**

A2:

Financial Literacy

- An investment with a high return is likely to be high risk.
- High inflation means that the cost of living is increasing rapidly.
- It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares.
- It is less likely that you will lose all of your money if you save it in more than one place.

Digital Literacy (Ng, 2012)

- I like using ICT for learning.
- I learn better with ICT.
- ICT makes learning more interesting.
- I am more motivated to learn with ICT.
- ICT enables me to be a self-directed and independent learner.
- There is a lot of potential in the use of mobile technologies (e.g. mobile phones, PDAs, iPods, smartphones etc.) for learning.
- Teachers/lecturers should use more ICT in their teaching of my classes.
- I know how to solve my own technical problems.
- I can learn new technologies easily.
- I keep up with important new technologies.
- I know about a lot of different technologies.

- I have the technical skills I need to use ICT for learning and to create artefacts (e.g. presentations, digital stories, wikis, blogs) that demonstrate my understanding of what I have learnt.
- I have good ICT skills.
- I am confident with my search and evaluate skills in regards to obtaining information from the Web.
- I am familiar with issues related to web-based activities e.g. cyber safety, search issues, plagiarism.
- ICT enables me to collaborate better with my peers on project work and other learning activities.
- I frequently obtain help with my university work from my friends over the Internet e.g. through Skype, Facebook, Blogs.