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Assessing Digital Financial Literacy and Its adoption in Microfinance Services Among Rural Women

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Abstract

Purpose: Digital Financial Literacy (DFL) refers to the capability to utilize technology for conducting financial transactions. DFL plays a pivotal role in broadening access to financial services. Nevertheless, its adoption in rural microfinance needs further investigation. This study assesses the prevailing DFL level among rural women, explores its impact on the use of digital platforms for microfinance transactions and identifies barriers to its adoption.

Methodology: A quantitative methodology using a structured questionnaire was utilized to collect data from rural women, with responses analyzed through descriptive statistics, the chi-square test, as well as logistic regression.

Findings: The findings indicate that rural women possess moderate levels of digital financial literacy. Statistical analysis revealed a marginally significant relationship between DFL level and the adoption of digital platforms, implying that other factors may influence adoption. The regression analysis indicated a significant negative relationship between these variables suggesting that a higher DFL level leads to lower digital microfinance use. Therefore, this study underscores qualitative factors such as lack of trust, confidence, and security concerns as primary barriers to digital microfinance transactions. Despite the availability and knowledge of digital platforms, traditional payment channels are still the norm for microfinance transactions among rural women.

Practical Implications: The findings emphasize the significance of the implementation of confidence-building measures and digital training programs for enhancing the use of digital platforms in the rural microfinance context.

Social Implications: The study adds value by examining the primary challenges and opportunities for microfinance in rural areas and provides recommendations to microfinance institutions and policymakers to further enhance the digital financial participation of rural women.

Originality: The study presents a unique perspective on the relationship between DFL and digital microfinance adoption in rural communities.

Categories: Banking and financial services, Digital business
Keywords: digital financial literacy, microfinance, rural women, digital platforms, adoption

Introduction

Digital financial literacy is the capacity to carry out financial transactions through the use of digital technology (Yadav and Banerji, 2024). A digitally financially literate individual has the capacity to utilize digital devices to make informed decisions on financial matters (Golden and Cordie, 2022). It includes knowledge of using multiple digital channels, such as digital wallets, mobile banking, and unified payment interfaces (UPIs), to perform financial transactions and make financial decisions.

Microfinance Institutions (MFIs) are fundamental in mobilizing access to financial services to poor, rural women and low-income communities. They also provide financial services to poor households (Hasan et al., 2021). They provide various services such as micro-loans, micro-insurance, and micro-savings which can support household financial stability and promote entrepreneurship. In India, MFIs operate through different modes as follows (Chattopadhyay, 2019):

· Non-Banking Financial Company (NBFC-MFI)

· Joint Liability Groups

· Rural Co-operatives

· The Grameen Bank Model

· Self Help Groups

These microfinance channels contribute to improving financial inclusion by offering credit in rural and remote areas.

There is a growing focus on digitalization, and the government has continuously encouraged the use of digital channels for financial transactions. The government has also initiated programs such as the Jan Dhan-Aadhaar-Mobile (JAM) trinity, Digital India, and financial literacy programs to acquaint rural people with digital financial services (Goel, 2020). Similarly, MFIs have gradually started to adopt digital platforms for loan disbursement, repayments, and tracking.

But to what extent rural women utilize digital platforms for microfinance transactions remains unknown. While rural women may possess smartphones and be aware of digital payment methods, it is unclear whether digital platforms are the preferred channels in microfinance operations. Presumably, challenges and issues which may restrict their use can be ascertained through this study.

Literature review

Role of Digital Technology on Literacy

Several previous studies have examined the evolving relationship among fintech, financial inclusion, and financial literacy in recent years, with a focus on low-income and rural populations. Kulshrestha (Kulshrestha, 2023) explored how fintech aids low-income families in India in becoming more financially inclusive and literate. In addition to reviewing the literature, key stakeholders in the Indian fintech sector were interviewed. The study concluded that fintech has the potential to significantly enhance the financial literacy and inclusion of low-income Indian families. It also suggests regulatory changes to boost investments in digital infrastructure and foster the growth of the fintech sector in India. In a similar vein, Yang (Yang et al., 2023) utilized the 2015 and 2017 China Household Finance Surveys to assess financial literacy and its impact on household consumption of digital finance. Their research indicates that financial literacy enhances digital finance consumption, with a more pronounced effect on online financial products than on mobile payments. They also find that digital financial literacy significantly encourages marginalized rural populations to adopt digital financial services. Additionally, Okičić and Jukan (Okičić and Jukan, 2023) have discussed the relationship between digital financial literacy and financial inclusion, emphasizing the critical role of MFIs in enhancing their clients' financial inclusion and literacy. They provide evidence that efforts to promote financial literacy in the digital era drive growth in the demand for digital financial services. They conclude that MFIs have the potential to significantly enhance financial literacy by adopting best practices. Similarly, Banciu et al. (Banciu et al., 2022) employed an experimental setup to quantify the effect of digital financial literacy education on rural residents' financial behavior. They concluded that despite the increased accessibility of financial services, unsound financial habits are perpetuated by low financial literacy. To further understand the positive impact of microfinance on impoverished populations in Cambodia, they proposed the development of financial literacy centers and the deployment of financial literacy counsellors. Additional contributions to the body of literature are made by Çalişkan (Çalişkan, 2024), who investigated the effects of digitalization on the economic decision-making and investment behavior of individuals. The study concluded that ill-informed investment decisions and poor financial decisions are often the result of a lack of digital financial literacy. Ensuring a financially sustainable environment, the study suggests the implementation of a multi-faceted regulatory system and the incorporation of digital tools in financial literacy. Complementing the above, Omowole et al. (Omowole et al., 2024) investigated the strategies of successful financial literacy programs in MFIs. They concluded that the major components of successful financial literacy programs include group training and workshops facilitated by MFIs. They acknowledged the problem of funding faced by MFIs and suggested the enhancement of the same in order to enhance the success of such programs.

Digital Microfinance and Financial Inclusion

The role of digital microfinance in enhancing the cost-effectiveness and access of financial services to the underbanked has been explored in different past research studies. Celestin and Vanitha (Celestin and Vanitha, 2016) aimed to assess whether digital microfinance enhances cost-effectiveness and access to financial services among the underbanked. Their mixed-

methods assessment indicated that mobile microfinance assists in poverty reduction and increases account ownership, thereby bridging gaps in traditional financial services. They advocate for more efforts to enhance digital financial literacy. Based on related evidence, Kandie and Islam (Kandie and Islam, 2022) explored the ability of digital microfinance services to accelerate poverty reduction programs, particularly among economically vulnerable households in rural Uganda. Their assessment confirmed that households that used digital microfinance services increased their monthly income compared to non-users. The study established a connection between efficient use of microfinance services and high digital and financial literacy levels, calling for continued support for digital microfinance services to impact low-income households in Uganda. Building on this discussion, Kumar and Aithal (Kumar and Aithal, 2024) conducted an in-depth review of the literature summarized from an array of academic databases, institutional reports, and policy documents. Their ABCD analysis sought to draw insights from clients and firms alike. Their findings indicated toward the manner in which digital microfinance schemes have empowered economically marginalized communities in India and thus contributed toward poverty alleviation.

Digital Improvements and Transformation of Microfinance Services

The transformation of microfinance services through digital innovation has garnered increasing research interest. Moin and Kraiwanit (Moin and Kraiwanit, 2023) explored digital advancements in microfinance through a qualitative study involving in-depth interviews with 10 key informants. Their research indicated that digital technology can benefit the microfinance sector in multiple ways, including reducing operational costs, facilitating faster and more efficient transactions, and improving access to financial services for underbanked individuals and rural communities. They proposed the use of quantitative research techniques with questionnaires and employing larger sample sizes for future studies. A critical analysis of the opportunities extended by digital lending platforms to MFIs was realized by reviewing a few case studies by Omowole BM et al. (Omowole BM et al., 2024). They highlighted the role of financial technology in the provision of funding alternatives for small businesses and promoted regulatory guidelines that support and boost the role of fintech in the betterment of credit availability globally and constant innovation. Similarly, Kumar and Aithal (Kumar and Aithal, 2024) also examined the influence of digital technologies on the operational efficiency of the microfinance sector and its role in financial inclusion. They also examined beneficiary satisfaction through a mixed-method approach, in which it was found that participants showed higher satisfaction with digital microfinance programs due to their higher convenience and ease of access. They suggested the optimum utilization of digital microfinance services in the region under study. Moreover, Aziz and Kengere (Aziz and Kengere, 2024) explored the impact of informative Internet banking on the performance of Copedu PLC Microfinance in Rwanda. Their study sought to determine if such access influenced financial performance, customer retention, or satisfaction, using quantitative and qualitative data in a descriptive research design. The findings were significant, with a strong correlation found between financial performance and informative Internet banking, further increasing convenience, operational efficiency, and transparency. They theorized further development of digital banking and that future research should investigate adoption challenges. Contributing to this further, Offiong et al. (Offiong et al., 2024) conducted a systematic review of the literature on fintech in microfinance to identify key areas of research and emerging issues. Their findings showed that the primary drivers of fintech adoption were increases in operational efficiency, customer satisfaction, and financial inclusion, and that further empirical research should be done to ascertain the long-term implications of digital transformation. Lastly, Binaluyo et al. (Binaluyo et al., 2024) explored the drivers of digital transformation in Microfinance Institutions in the Philippines using a descriptive research design consisting of interviews with MFI owners and clients. They theorized the implementation of financial literacy programs and improved cybersecurity for customers.

Digital Payment Systems and Performance of Microfinance Institutions

Asimiyu et al. (Asimiyu et al., 2024) examined the impact of electronic payment systems on the financial performance indicators of MFIs based on Return on Assets and Return on Equity from banks' annual reports. Their findings confirmed that electronic payment systems positively and significantly impact financial performance; however, adoption is limited due to low technological literacy, low smartphone penetration rates, and insufficient knowledge and confidence in using digital financial services. Likewise, in a study conducted in a different geographic region, Pranatasari et al. (Pranatasari et al., 2021) established that digital Islamic financial inclusiveness and literacy were drivers of the rising profitability of microfinance business. They collected data from Micro, Small, and Medium Enterprises (MSMEs) owners using quantitative methods and questionnaires with findings indicating that digital Islamic financial inclusion had no impact on the profitability of MSMEs but that digital Islamic financial literacy significantly impacted it. Following this line of research, Annisa et al. (Annisa et al., 2024) conducted a quantitative survey of Z Digital Bank customers. Findings indicated that these customers possessed high digital literacy and social capital and high usability. The

study emphasized the critical role played by both digital and financial literacy in propelling financial inclusion. Against the background of the prevailing trend of digitization, they recommended the utilization of methods to propel the adoption of digital financial services. Complementing this discourse, Bongomin et al. (Bongomin et al., 2020) identified social networks as a mediating factor in the relationship between financial inclusion and financial literacy, particularly through MFIs. Utilizing a cross-sectional methodology, they collected data from rural participants. Their findings demonstrated that social networks significantly mediated the aforementioned relationship. Furthermore, they recommended financial literacy training for members of village organizations and suggested future research should involve data collection from customers of MFIs.

Literature summary and research gap

Several themes emerge from these studies, including the operational advantages of digital microfinance, the potential of fintech in rural economies, and the pivotal role that DFL plays in fostering inclusion. However, notable gaps persist within the body of this work. The existing literature predominantly focuses on institutional performance, fintech applications, or general rural and low-income populations; while the unique experiences and challenges faced by rural women remain underexplored. While a number of studies acknowledge the importance of MFIs in promoting literacy, they seldom investigate whether these organizations provide adequate support to their clients, particularly women.

Furthermore, while the significance of adoption is recognized, the behavioral, social, and infrastructural barriers limiting rural women's access to digital financial services are insufficiently examined. A more targeted study is necessary to elucidate how DFL level influences rural women's actual use of digital microfinance services and how MFIs can facilitate its adoption.

Objectives

1. To assess the current level of digital financial literacy among rural women.

2. To examine the influence of DFL levels on the adoption of digital platforms for microfinance transactions.

3. To identify barriers to the adoption of digital platforms for microfinance transactions.

Significance

This study assessed the DFL level among rural women and examined the relationship between DFL and the actual usage of digital platforms for microfinance transactions. This assessment will help in the identification of reasons and factors for low usage, if present, and bridge the gap between access, awareness, and digital microfinance adoption.

For the government and other official authorities, the results of this study can guide policy refinements in financial literacy programs and improve the digital infrastructure in rural areas. MFIs can derive insights into expanding the digital outreach of microfinance and take necessary measures to bolster the confidence of rural women while using digital financial tools.

Hypothesis

The hypothesis was formulated to determine the association between the DFL level and the actual adoption of digital platforms and to ascertain whether it translates into the adoption and usage of digital tools for microfinance services.

H_0: There is no significant relationship between the DFL level and the use of digital platforms/tools for microfinance transactions by rural women.

H_1: There is a significant relationship between the DFL level and the use of digital platforms/tools for microfinance transactions by rural women.

This article was previously presented at the International Conference on Managing a Sustainable World, Mumbai- 04th and 05th April 2025.

Research Method

This study employs a quantitative method to examine the correlation between DFL levels and the adoption of digital microfinance services. The study population comprised women residing in the rural areas of Kalyan taluka, Thane district, who may or may not be engaged in microfinance services.

A multistage random sampling approach was utilized in this study. Initially, villages in Kalyan Taluka-

Bhisol, Nimbavli, Manivali, Raya, Varap, Kamba, Guravli, Chinchavli, Vaveghar, Rayate, Ane, Mharal, and Nalimbi-were selected through random sampling. Subsequently, rural women from these villages were chosen randomly to form the sample, finally including 150 participants. Referring to the total rural female population of 2,53,820 in rural Kalyan Taluka as per the Census of India, 2011, and assuming a 95% confidence level and a 50% response distribution, the selected sample size corresponds to an estimated margin of error of approximately 8%. The sample size was considered adequate for meaningful analysis.

A structured questionnaire was developed to collect responses and the questions included close-ended and Likert-scale questions. A 4-point Likert scale was employed to gather responses, with Strongly Disagree scoring 1 and Strongly Agree scoring 4. Face-to-face surveys were adopted to collect data, and the questionnaire was also offered online to respondents with reading skills and internet access.

Analytical techniques

· Mean DFL Score: To determine the average digital financial literacy score among respondents.

· Standard Deviation: To measure variability in DFL levels.

· Chi-square test and Logistic Regression: To evaluate the relationship between the DFL levels and utilization of digital platforms for microfinance transactions. The below Table *1* indicates the different modalities related to data analysis:

Research Design	Descriptive and Analytical
Sampling Method	Multi Stage Random Sampling
Population	Women in Rural Kalyan
Sample Size	150
Tools Used	Percentage Analysis using MS Excel
Data Collection Method	Questionnaire
Data Presentation Tools	Tables
Data Analysis Device	Mean, Standard Deviation and Percentage Analysis
Hypotheses Testing	The chi-square Test

TABLE 1: Modalities Regarding Analysis

Source: Author

Results

Digital financial literacy level

To evaluate the DFL level, respondents were presented with five questions as outlined in Table *2*, to which they were required to respond with either "Correct," "Incorrect," or "Do not know."

Question No.	Question Description	Answer Options to the Respondents
1	If you borrow ₹1,000 from a lender and they charge interest, you will have to pay back more than ₹1,000.	Answer Options: Correct, Incorrect or Don't Know
2	Instant money transfers between bank accounts are made possible via Unified Payments Interface (UPI).	
3	A digital wallet (such as Google Pay, Paytm, or PhonePe) allows you to make payments without needing a bank account.	
4	Saving money regularly, even in small amounts, can help during emergencies.	
5	Investing money in different options (like bank deposits, gold, or land) is safer than keeping all the money in one place.	

TABLE 2: Questions Asked to Respondents to Assess the DFL Level

DFL, Digital Financial Literacy

Source: Author

Each respondent was assigned a total score out of five, with one point awarded for each correct response and zero for incorrect responses. Based on this scoring, the mean DFL level and Standard Deviation were calculated, as shown in Table 3.

Mean Digital Financial Literacy Level	Standard Deviation
3.64	1.21
Indicating a moderate Digital Financial Literacy Level of the respondents	As the standard deviation is not above 1.5, there is less variation of DFL level among respondents and the literacy levels are consistent across respondents

TABLE 3: Results on Digital Financial Literacy Level and Standard Deviation

DFL, Digital Financial Literacy

Source: Primary Data from the questionnaire

Hypothesis testing

The hypotheses tested were as follows:

H_0: There is no significant relationship between the DFL level and the use of digital platforms/tools for microfinance transactions by rural women.

H_1: There is a significant relationship between the DFL level and the use of digital platforms/tools for microfinance transactions by rural women.

The variables considered were as follows:

1) Independent Variable - Digital Financial Literacy Level

2) Dependent Variable - Usage of digital platforms for microfinance

The independent variable of "Digital Financial Literacy Level" is derived as discussed above (see Table 2), and the dependent variable, "Usage of digital platforms for microfinance," was derived from responses to the following statement posed to the respondents:

"I have used digital channels (such as UPI or mobile banking) for Microfinance transactions - Loan applications or Repayments."

This question is also included in the questionnaire under appendices and it was assessed using a 4-point Likert scale, with the responses coded as follows:

1 = Strongly Disagree

2 = Disagree

3 = Agree

4 = Strongly Agree

Then the chi-square test (Test of Association) was employed with the following result as displayed in Table *4*:

χ^2 Tests			
Value		df	p
χ^2	19.2	12	**0.084**
N	150		

TABLE 4: Hypothesis Test Results

Source: Authors' Analysis

χ^2 - chi square

N - Number of values

df - Degrees of freedom

p - Probability value

Along with the above result, Table *5* below is the cross-tabulation which gives a clearer visualization of how respondents with different levels of digital financial literacy vary in their usage of digital platforms for microfinance transactions, supporting the use of the chi-square test applied above.

	Cross-Tabulation Table				
Digital Financial Literacy Level	**Usage of Digital Platforms for Microfinance**				
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Total**
1	1	2	0	0	3
2	9	21	0	0	30
3	14	24	0	0	38
4	4	17	5	0	26
5	17	27	7	2	53
Total	**45**	**91**	**12**	**2**	**150**

TABLE 5: Cross-Tabulation Table between Digital Financial Literacy Level and Usage of Digital Platforms for Microfinance

Source: Primary Data from the questionnaire

The p-value, as calculated in Table 4, was compared to a significance level of 0.05. Typically, the null hypothesis is accepted if the p-value exceeds 0.05 and rejected if it is less than 0.05. In this case, the p-value is 0.084, which is above the 0.05 threshold, and therefore, the null hypothesis is not rejected. However, since the p-value is below 0.10, at 10% significance level, this result can be considered marginally significant. This suggests a potential but weak association between rural women's use of digital platforms for microfinance transactions and their Digital Financial Literacy level.

Other parameters-percentage analysis

Parameter	Number	Percentage
Education Level:		
No Formal Education	13	8.70%
Primary, Secondary, or Higher Secondary Education	129	86%
Graduate Degree	8	5.30%
Occupation:		
Farming or Running Small Business	27	76%
Labourers	114	19%
Annual Household Income:		
Below Rs. 1,50,000	116	77%
Between Rs. 1,50,000 and 2,00,000	21	14%
Above Rs. 2,00,000	13	9%
Ability to Read and Write:		
Able to Read or Write	134	89%
Not able to Read or Write	16	11%

TABLE 6: Education Level, Occupation, Income, Ability to Read or Write

Source: Primary Data from the questionnaire

Table 6 presents additional parameters of the respondents. Only 5.3% of the respondents possessed a graduate degree, as indicated in the accompanying table. Among the respondents, 86% had completed basic, secondary, or higher secondary education, while 8.7% had not attended any formal schooling. While 19% of women were employed as laborers, 76% of respondents were farmers or small business owners. In all, 77% percent of women earn less than Rs. 1,50,000 annually. Only 9% of respondents had an annual household income over Rs. 2,00,000, while 14% earned between Rs. 1,50,000 and Rs. 2,00,000. Among the total women, 89% were literate.

Parameter	Percentage w.r.t Total Respondents
Access to or own a smartphone	**74.70%**
Regular access to internet facility	64.70%
Occasional access to internet	19.30%
No access to internet	16%
Use of digital platforms and tools:	Almost all of them
A) For Payment of bills like electricity, mobile recharge, money transfer, purchase of day-to-day items, online ordering, checking bank account balances by Smartphone Users	
B) For making loan repayments or for doing any other microfinance transactions using Digital Tools	**Only 0.7%**

TABLE 7: Utilization of Digital Tools for Availing Microfinance

Source: Primary Data from the questionnaire

w.r.t - with respect to

Table 7 provides results regarding the utilization of digital tools for microfinance by respondents. Out of the total 150 women, 74.7% had access to or owned a smartphone while the remainder possessed only a basic phone without smart features. Regular access to internet facilities was available to 64.7% of them, occasional access to 19.3% and 16% had no Internet access. Those with smartphone and internet access utilized digital platforms and tools for activities such as bill payments (electricity, mobile recharge), money transfers, purchasing daily necessities, online ordering, and checking bank account balances. However, only 0.7% used these platforms for loan repayments or other microfinance transactions.

Parameter	Percentage w.r.t Total Respondents
Awareness about the various microfinance modes and services provided in the area in which respondents reside	All of them (100%)
Utilization of one of the microfinance services in the past or are currently using it	97.33%

TABLE 8: Awareness About Microfinance Services

Source: Primary Data from the questionnaire

w.r.t - with respect to

Parameter	Percentage w.r.t Total Respondents
Self-Help Groups	97.33%
Joint Liability Groups	77.3%
Grameen Bank	57.3%
Rural Co-operatives	16.7% - Low outreach in the rural areas
NBFC-MF	3.3% - Low outreach in the rural areas

TABLE 9: Utilization of Various Microfinance Modes by Respondents

Source: Primary Data from the questionnaire

w.r.t - with respect to. NBFC-MF, Non-Banking Financial Company - Microfinance

Parameter	Percentage w.r.t Total Respondents
Individual loans availed	95.3%
Group lending loans availed	74.7%
Savings account (micro savings)	39.3%
Insurance (micro insurance) service availed	23.3%
Purposes for which microfinance services were accessed	
Starting and expansion of business	48.7%
Farming activities	61.3%
For household or personal needs like health, education	75.3%
For improving financial situation	20%

TABLE 10: Type of Microfinance Loans Availed by Respondents

Source: Primary Data from the questionnaire

w.r.t - with respect to

In Tables *8*, *9*, and 10, the awareness, utilization and types of microfinance loans accessed by respondents are presented. All respondents (100%) were aware of the various microfinance modes and services available in their area. A total of 97.33% of women either previously utilized or were currently utilizing one of these services. Self-Help Groups emerged as the most utilized microfinance mode (97.33%), followed by Joint Liability Groups (77.3%) and Grameen Bank (57.3%). Rural cooperatives and NBFC-MFI were the least utilized modes, with usage rates of only 3.3% and 16.7%, respectively, indicating limited outreach of these modes in rural areas. Similarly, Individual loans and Group Lending loans (micro loans) were the most frequently accessed microfinance services, with 95.3% of women taking individual loans and 74.7% opting for group loans. Savings Account (micro savings) and insurance (micro insurance) services were also utilized by 39.3% and 23.3% of respondents, respectively. The primary purposes for accessing these microfinance services included business initiation and expansion (48.7%), farming activities (61.3%), and household or personal needs such as health and education (75.3%), with 20% of respondents also taking loans to improve their financial situation.

Digital Awareness and Usage

Parameter	Percentage w.r.t Total Respondents
Awareness about various digital platforms available for use like mobile banking, UPI, mobile wallets, and others	72.66%
Know how to use digital platforms and applications for performing transactions or making payments	57.33%
Understanding of security measures required while using digital applications	50.66%
Though aware of using digital platforms but still not confident while performing digital and online transactions	66.67%
Have not received formal training or guidance about using digital applications and platforms	68.66%

TABLE 11: Digital Awareness and Usage by Respondents

Source: Primary Data from the questionnaire

w.r.t - with respect to

UPI - Unified Payment Interface

Table *11* illustrates the digital awareness and usage of such tools among respondents. A total of 72.66% of rural women were familiar with various digital platforms available for use, such as mobile wallets, UPI, and mobile banking. Of these, 57.33% knew how to use these platforms and applications to perform transactions or payments. An understanding of the necessary security measures while using digital applications was present among 50.66% of women. Despite this awareness, 66.67% of them lacked confidence in performing digital and online transactions. Furthermore, 68.66% of the women had not received formal training or guidance on using digital applications and platforms.

Digital Adoption for Microfinance Services

Parameter	Percentage w.r.t Total Respondents
Despite having digital finance awareness, women still do prefer traditional methods (cash, cheque) over digital platforms for microfinance transactions	95.33%
Have not used digital channels for loan applications and loan repayments	90.66%
Traditional methods more convenient for accessing microfinance transactions as compared to digital platform	92%
Lack of trust about digital platforms for management of microfinance activities	94.66%
Of the opinion that digitalization has improved their access to credit and savings	Only 39.33%

TABLE 12: Digital Adoption for Microfinance Services by Respondents

Source: Primary Data from the questionnaire

w.r.t - with respect to

Table *12* highlights the adoption of digital tools for microfinance transactions. Despite awareness and usage of digital tools for other types of transactions, 95.33% of women still preferred traditional methods (cash, cheque) over digital platforms for microfinance transactions. This preference was also reflected in usage patterns, as 90.66% of respondents did not use digital channels for loan applications and repayments. A total of 92% found traditional methods more convenient for accessing microfinance transactions than digital platforms. A lack of trust was identified as a potential reason, with 94.66% of

respondents expressing distrust in digital platforms for managing microfinance activities. Only 39.33% believed that digitalization had improved their access to credit and savings.

The use of digital platforms for various microfinance activities, such as monitoring loan repayment and comparing different microfinance products, remains limited, with approximately 90% of entities not employing digital tools for these purposes. The general perception of digital financial services is somewhat negative, as 54% of respondents report no perceived improvement in financial decision-making or management of financial transactions.

Barriers to Adoption

Parameter	Percentage w.r.t Total Respondents
Agree that one of the main obstacles to digital adoption is a lack of consistent internet connectivity	42%
Find it difficult to understand and use digital applications and tools	72.66%
Concerned about security risks and frauds in digital transactions	**96%**
Lack of awareness and not getting training of different digital applications contribute to less adoption of digital platforms especially for microfinance transactions	82%

TABLE 13: Barriers to Digital Adoption for Microfinance Services by Respondents

Source: Primary Data from the questionnaire

w.r.t - with respect to

The barriers encountered by respondents in adopting digital solutions for microfinance are detailed in Table *13* above. A significant barrier is the lack of consistent Internet access, as indicated by 42% of participants. Additionally, 72.66% of women cite difficulties in comprehending and utilizing digital applications and tools as another impediment. The primary obstacle to the adoption of digital platforms is concerns regarding security risks and fraud in digital transactions, as agreed upon by 96% of respondents. This is further evidenced by the prevailing lack of trust and preference for traditional methods, such as cash and cheque, for repayments, as previously discussed. Furthermore, 82% of respondents believe that a lack of awareness of various digital applications and insufficient training on their use also contribute to the lower adoption rates, particularly in the context of microfinance transactions.

Regression analysis

To further warrant the above results and include other parameters, a logistic regression analysis was conducted considering the following:

Dependent Variable: Usage of Digital Platforms for Microfinance

Main Independent Variable: Digital Financial Literacy Level

Control Variables: Age, Education, Occupation, Income, Smartphone and Internet Access

This analysis examined the relationship between Digital Financial Literacy Level, various demographic factors, access factors, and the Usage of Digital Platforms for Microfinance which was the dependent variable. All these other factors were considered as control variables. All the variables are indicated in Table *14*. The dependent variable was converted into binary indicating whether respondents used digital platforms for microfinance. Responses marked as Strongly Disagree and Disagree were coded as 0, indicating non-usage, while Agree and Strongly Agree were coded as 1, indicating usage. This dichotomization reflected behavioral adoption than mere awareness. This threshold was chosen on the basis that only those who expressed agreement (to any degree) could be reasonably classified as actual users of digital platforms for microfinance.

The formula for this regression model is as below in equation (1):

$$(p_1 = \frac{1}{1 + \exp\left(-\left(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7\right)\right)} \quad \text{.....(1)}$$

The explanation of these variables is given in Table *14* below:

Particulars	Variable
p_1	Usage of Digital Platforms for Microfinance
x_1	Digital Financial Literacy Level
x_2	Age of the Respondent
x_3	Educational Qualification of the Respondent
x_4	Occupation of the Respondent
x_5	Annual Household Income of the Respondent
x_6	Access to Smartphone by Respondent
x_7	Access to Internet by Respondent

TABLE 14: Description of Variables Used in Formula

Source: Author

p_1 - Dependent Variable

x - Independent Variables

Model	N	R^2_{McF}	χ^2	df	p
1	150	0.208	38	7	<0.001

TABLE 15: Model Fit Measures and Overall Model Test

Source: Authors' Analysis

N - Number of Observations

R^2McF - McFadden's R-squared

χ^2 - chi-square

df - Degree of freedom

p - Probability value

Omnibus Likelihood Ratio Tests			
Predictor	χ^2	df	p
Digital Financial Literacy Level	8.932	1	0.003
Age of the Respondent	3.778	1	0.052
Educational Qualification of the Respondent	1.485	1	0.223
Occupation of the Respondent	1.806	1	0.179
Annual Household Income of the Respondent	6.344	1	0.012
Access to Smartphone by Respondent	0.316	1	0.574
Access to Internet by Respondent	5.551	1	0.018

TABLE 16: Likelihood Ratio

Source: Authors' Analysis

χ^2 - chi square

df - Degree of freedom

p - Probability value

As displayed in Table *15* and Table *16*, the regression model demonstrated a moderately significant improvement in fit compared to null model. The model yielded a McFadden's pseudo R^2 of 0.208, indicating that approximately 20.8% of the variance in the usage of digital microfinance platforms is explained by the model. The overall model was statistically significant, as indicated by the Likelihood Ratio chi-square test: $\chi^2 = 38$, $p = < 0.01$. This result represents that the inclusion of the predictors significantly improves the model's ability to distinguish between users and non-users of digital microfinance platforms.

Model Coefficients - Usage of Digital Platforms for Microfinance				
Predictor	Estimate	SE	Z	p
Intercept	3.424	1.357	2.522	0.012
Digital financial literacy level	-0.77	0.277	-2.779	0.005
Age of the respondent	-0.487	0.254	-1.919	0.055
Educational qualification of the respondent	-1.199	0.999	-1.2	0.23
Occupation of the respondent	0.74	0.552	1.341	0.18
Annual household income of the respondent	0.612	0.261	2.35	0.019
Access to smartphone by respondent	0.443	0.784	0.565	0.572
Access to internet by respondent	2.118	0.948	2.234	0.025

TABLE 17: Regression Analysis

Source: Authors' Analysis

SE - Standard Error

Z - z-statistic

p - Probability value

The result of the regression model is displayed in Tables *16* and Table *17* and its interpretation given below is based on the comparison of the p value in table with the significance level of 0.05:

Digital Financial Literacy Level was a statistically significant predictor. Its likelihood ratio test result was χ^2 as 8.93, with a p value of 0.003 and the regression coefficient was negative indicating an inverse association with platform usage (Estimate = -0.77, p = 0.005). This suggests that individuals with higher digital financial literacy were less likely to use digital platforms for microfinance. This could be because digitally literate individuals may be more aware of risks such as fraud or data breaches, leading to their more cautious behavior.

Annual Household Income showed a significant positive effect, the likelihood-ratio test produced χ^2 of 6.344 and p value of 0.012 and the regression coefficient was Estimate = 0.612, p = 0.019, indicating that higher-income respondents were more likely to engage with digital platforms, likely due to greater financial capacity and access to digital infrastructure. Similarly, **Access to Internet** was a strong and significant predictor (Estimate = 2.118, p = 0.025, χ^2 = 5.551, p = 0.018), underscoring the critical role of network connectivity in facilitating digital financial inclusion.

Age of the Respondent was marginally significant (Estimate = -0.487, p = 0.055, χ^2 = 3.78, p = 0.052), suggesting a potential trend where older individuals may be less inclined to adopt digital microfinance tools. This may reflect generational differences in digital comfort or exposure.

Other variables such as **Educational Qualification** (dummy-coded: 0 = no formal education, 1 = formal education; Estimate = -1.199, p = 0.230; χ^2 = 1.49, p = 0.223), **Occupation** (dummy-coded: 0 = unorganized sector, 1 = organized sector; Estimate = 0.74, p = 0.180; χ^2 = 1.806, p = 0.179), and **Access to Smartphone** (Estimate = 0.443, p = 0.572; χ^2 = 0.316, p = 0.574) did not yield statistically significant results, indicating no major influence on digital microfinance usage.

Discussion

According to the calculation of the mean DFL level, a moderate DFL level was identified among the target participants, indicating that the respondents possessed awareness and basic knowledge of financial aspects and were capable of utilizing digital platforms for transactions.

H_0: Accepted (chi-square test)-The findings suggest that there is only marginal significant correlation or influence of DFL level on the adoption of digital platforms for microfinance transactions by rural women. This implies that digital microfinance adoption is contingent not only on the DFL level but also on other influencing factors. Merely possessing knowledge about digital platforms does not necessarily translate into their use for microfinance transactions.

These findings challenge the presumed direct relationship between DFL level and adoption. For instance, Yang et al. (Yang et al., 2023) concluded that DFL significantly enhances the use of digital finance among rural populations in China. Similarly, Annisa et al. (Annisa et al., 2024) found digital and financial literacy to be strongly associated with financial inclusion among digital banking users. However, the results from this study challenge this association and underscore the role of various barriers in adoption, as also demonstrated by Asimiyu et al. (Asimiyu et al., 2024) who identified technology literacy gaps and lack of confidence as major impediments to digital service adoption.

Other findings reveal that digital adoption by rural women is primarily for routine day-to-day transactions, which may involve small amounts and are convenient and easy for them, but for loan repayments, cash and cheque modes remain the most preferred. This aligns with Kandie and Islam (Kandie and Islam, 2022) who also indicated that continued adoption of digital microfinance requires confidence and behavioral shifts. This is further supported by Bongomin et al. (Bongomin et al., 2020) who highlight that social network and community relationships affect inclusion, and not just the DFL level predicts it. While DFL level is important, its impact on adoption can also depend on other factors such as smartphone access, institutional trust, product relevance, and cultural familiarity, as implied by Binaluyo et al. (Binaluyo et al., 2024) in their finding from the Philippines.

The regression analysis further support the above findings by highlighting the inverse impact of DFL level on digital microfinance usage. Contrary to the general expectation of a positive relationship between DFL level and usage of digital platforms for microfinance, the regression model indicates a statistically significant negative relationship between DFL level and digital platform usage. This represents that respondents with higher DFL level are likely to use lesser digital platforms for microfinance transactions. This regression result represent the adjusted effect of DFL after accounting for potential confounders, and is therefore considered as the preferred estimate. A plausible explanation for this counterintuitive result lies in the behavioral implications of digital literacy. Respondents with higher DFL may be more aware of risks associated with online financial transactions, such as fraud, data breaches, and lack of institutional safeguards. This increased awareness could lead to cautious or selective engagement with digital

microfinance platforms as is also noted by the fact that most of the respondents have this concern.

Other variables such as annual household income and access to internet were positively and significantly associated with platform usage, underscoring the role of economic capacity and connectivity in enabling digital adoption. Age showed a marginally significant negative effect, suggesting that older individuals may be less inclined to adopt digital platforms, possibly due to lower digital comfort or exposure. It also points out that education and occupation did not have a significant effect on digital adoption, suggesting that digital financial literacy needs to be understood as a part of larger system.

Thus, this study provides a unique perspective on the general perception that DFL levels can ensure its use and adoption. It attempts to enumerate other factors and barriers limiting digital microfinance adoption among rural women and recommends improvements in this regard as emphasized by Celestin and Vanitha (Celestin and Vanitha, 2016), its success will depend on socio-economic factors and confidence in digital financial system. It also calls for MFIs to evaluate whether current digital financial literacy efforts are sufficient, a concern also raised by Çalişkan (Çalişkan, 2024) and Omowole et al. (Omowole et al., 2024) who emphasize the need for sustained financial literacy interventions.

Limitations

The study's sample size, which was limited to 150 respondents, represents one of its main limitations. Although the results provide valuable insights into the relationship between digital financial literacy and rural women's adoption of digital microfinance services, the applicability of the results to a larger population is constrained by the sample size. The sample was selected to address the requirements of this initial stage, with the aim of examining patterns and identifying important variables for further research. A larger and more diverse sample will be part of the next stage of the study for more in-depth analysis and broader generalization, so as to increase the validity and applicability of the results.

Conclusions

This study highlights that rural women have moderate but consistent levels of digital financial literacy. Even though they have awareness of digital platforms and tools, and they make its use for routine transactions, the adoption of digital microfinance transactions is significantly low.

The major findings reveal that trust issues, security concerns, lack of training and preference for traditional methods are the main barriers to the adoption of digital microfinance services. Therefore, it can be concluded that cash and cheques are the preferred payment methods for microfinance among rural women.

They derive satisfaction from making cash payments and receiving physical receipts or acknowledgments, especially in the case of loan repayment and microfinance transactions. They have the opinion that online transactions are risky, and they fear the possibility of having to make payments again, thus preferring traditional methods only. This emphasizes issues regarding security and fraud risks.

Statistical analysis supports these observations. Hypothesis testing of chi-square test revealed only a marginally significant relationship between DFL levels and platform usage, while regression analysis indicated a statistically significant negative association. This suggests that higher literacy may correlate with greater risk awareness, leading to cautious behavior. Additionally, factors such as income, internet access and age were identified as influencers of usage, reinforcing the need to view digital literacy as part of a larger ecosystem.

In conclusion, awareness and moderate literacy levels alone are insufficient to drive digital microfinance uptake. There is an urgent need for targeted interventions that build trust, enhance digital skills, and address contextual barriers. MFIs must evaluate the effectiveness of current literacy programs and consider more sustained, inclusive strategies. Only through such comprehensive efforts can digital financial inclusion be advanced among rural women.

Contribution

By means of contributions, this research adds to the knowledge base in the areas of digital financial literacy and microfinance uptake. It takes into consideration the gap between digital microfinance service uptake and digital financial literacy. It establishes a strong preference for physical means (cash, cheque) over digital systems even with moderate levels of DFL. Trust and security issues are seen as a strong deterrent to digital take-up in rural financial systems. The implications of the study point to the necessity and importance of systematic digital training and education programs to build confidence and trust levels among rural women.

Policy implications

This study provides useful inputs to policymakers and MFIs. Training sessions via self-help groups (as SHGs are the most prevalent channel of microfinance) can be provided to build confidence in rural women to make online payments and transactions for microfinance operations. Regular internet access, mobile connectivity, and quality of digital infrastructure also need to be boosted, as was pointed out by some respondents as a barrier in the form of absence of regular internet access.

MFIs can provide fraud protection, grievance redressal systems, and customer support to reduce security concerns among rural women and develop trust in digital microfinance services. MFIs can also offer incentives such as reduced interest rates to promote the use of digital repayment methods by women. As traditional methods are still preferred, microfinance institutions can employ hybrid financial models that combine both services and gradually ensure a complete transition to digital platforms.

Future research directions

The scope of this study can be expanded to analyze variations across different rural areas and social groups. To comprehend the various factors influencing the adoption of digital microfinance, it is essential to examine psychological barriers, behavioral traits, and cultural and gender influences. Future longitudinal studies can also be conducted to evaluate the impact of digital financial literacy programs and initiatives on both digital microfinance and financial inclusion. Additionally, the potential of artificial intelligence, digital assistants, voice-based financial services, and chatbots can also be investigated to identify whether these tools can overcome barriers to digital microfinance adoption.

Appendices

The questionnaire used for the study is displayed below where Table *18* indicates questions about demographic factors of the respondents; Table *19* includes respondents' awareness and use of microfinance services and Table *20* represents the statements posed to respondents to ascertain their Digital Financial Literacy Level. Tables *21*, *22*, and 23 denote the statements with Likert scale options to find out the overall opinion, adoption, and utilization of digital microfinance services by the respondents. Table *24* displays the statements regarding barriers faced by respondents in adoption of digital platforms for microfinance.

No.	Question	Options
1	Age group	18-25/26-34/36-44/45-55/Above 55
2	Gender	Male/Female
3	Education level	No formal education/primary/secondary/higher secondary/graduate & above/professionals
4	Occupation	Farmer/small business/laborer/salaried employee/homemaker
5	Annual household income	Less than ₹1,00,000/₹1,00,001–₹1,50,000/₹1,50,001–₹2,00,000/ ₹2,00,001-₹2,50,000/₹2,50,001-₹3,00,000/Above ₹3,00,000
6	Ability to read and write of the respondent	Yes/No
7	Access to devices by respondent	Smart Phone/Normal Mobile Phone/Ipad/Laptop/Computer
8	Access to internet by respondent	Regular access (Wi-Fi/Mobile Data)/Occasional access/No access

TABLE 18: Demographics

Source: Author

No.	Question	Options
1	Purposes for which digital tools/platforms are used by the respondents	Any normal payments/bills/loan payment/accessing bank account/money transfer
2	I am aware of the various microfinance modes operating in my area (e.g., Self-Help Groups, Joint Liability Groups, Rural Cooperatives, Grameen Bank, NBFC-MFI)	Yes/No
3	I have used microfinance services in the past	Yes/No
4	Microfinance mode used by the respondent	Self-Help Groups (SHGs)/Joint Liability Groups (JLGs)/Rural Cooperatives/Grameen Bank/NBFC-MFI/None
5	Microfinance services used by the respondent	Individual loans/group lending (loans)/savings account/insurance/money transfer
6	Purpose for which loans were utilized by respondents	Starting/expanding business/farming activities/household or personal needs (health, education)/improve financial situation

TABLE 19: Awareness and Use of Microfinance Services

Source: Author

NBFC-MFI, Non-Banking Financial Company - Microfinance Institution

Question No.	Question Description	Answer options to the respondents
1	If you borrow ₹1,000 from a lender and they charge interest, you will have to pay back more than ₹1,000	Answer Options: Correct, Incorrect or Don't Know
2	Instant money transfers between bank accounts are made possible via Unified Payments Interface (UPI)	
3	A digital wallet (such as Google Pay, Paytm, or PhonePe) allows you to make payments without needing a bank account	
4	Saving money regularly, even in small amounts, can help during emergencies	
5	Investing money in different options (like bank deposits, gold, or land) is safer than keeping all the money in one place	

TABLE 20: Digital Financial Literacy Level

Source: Author

No.	Question	Options
1	I am aware of digital financial services such as mobile banking, UPI, and digital wallets	Strongly Disagree, Disagree, Agree, Strongly Agree
2	I know how to use mobile banking apps for transactions	
3	I understand the security measures needed to protect my digital financial accounts	
4	I feel confident making online financial transactions	
5	I have received training or guidance on using digital financial platforms	

TABLE 21: Opinion About Digital Tools

Source: Author

UPI, unified payment interface

No.	Question	Options
1	I prefer using digital platforms over traditional methods for microfinance transactions	Strongly Disagree, Disagree, Agree, Strongly Agree
2	I have used digital channels (such as UPI or mobile banking) for loan applications or repayments	
3	I find digital platforms more convenient for accessing microfinance services	
4	I trust digital financial services for managing my microfinance activities	
5	Using digital financial services has improved my access to credit and savings	

TABLE 22: Adoption of Digital Microfinance Services

Source: Author

UPI, unified payment interface

No.	Question	Options
1	I track my loan repayments digitally (through apps, SMS alerts, or online banking).	Strongly Disagree, Disagree, Agree, Strongly Agree
2	I use digital platforms to compare different microfinance products before choosing one.	
3	I save money using digital financial tools.	
4	Digital financial services have helped me manage my financial transactions better.	
5	I feel that using digital platforms has improved my financial decision-making.	

TABLE 23: Effective Utilization of Digital Microfinance Services

Source: Author

SMS - Short Message Service

No.	Question	Options
1	Lack of internet access is a barrier to using digital microfinance services.	Strongly Disagree, Disagree, Agree, Strongly Agree
2	I find digital financial platforms difficult to understand and use.	
3	I am concerned about security risks and fraud in digital transactions.	
4	I do not trust online financial transactions for microfinance services.	
5	There is a lack of awareness about digital financial services within my area.	

TABLE 24: Barriers to Adoption of Digital Platforms for Microfinance

Source: Author

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Sayali S. Nene, Sachin V. Acharekar

Acquisition, analysis, or interpretation of data: Sayali S. Nene

Drafting of the manuscript: Sayali S. Nene, Sachin V. Acharekar

Critical review of the manuscript for important intellectual content: Sayali S. Nene, Sachin V. Acharekar

Supervision: Sachin V. Acharekar

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References

1. Annisa DT, Soma AM, Sitorus PM: The influence of financial literacy, digital literacy, and social capital on digital bank financial inclusion through ease of use an intervening variable. International Journal of Social Science and Human Research. 2024, 7:8205-217. 10.47191/ijsshr/v7-i11-11
2. Asimiyu AK, Olusola AD, Oluwaseyi A A: Effect of electronic payment systems on the performance of microfinance banks in Nigeria. Journal of Business. 2024, 8:59-72.
3. Aziz S, Kengere O: Influence of informational internet banking on performance of Copedu PLC microfinance. International Journal of Finance and Accounting. 2024, 9:20-40. 10.47604/ijfa.3066
4. Banciu D, Arulanandam BV, Munhenga T, Larisa I: Digital financial literacy and microfinancing among underprivileged communities in Cambodia. Revista Română de Informatică şi Automatică. 2022, 32:77-92. 10.33436/v32i4y202207
5. Binaluyo JP, Santos AR, Agustin NB: Challenges and opportunities for digital transformation in Philippine microfinance institutions. International Journal of Economics and Financial Issues. 2024, 14:269-78. 10.32479/ijefi.16526
6. Bongomin GOC, Ntayi JM, Malinga CA: Analyzing the relationship between financial literacy and financial inclusion by microfinance banks in developing countries: social network theoretical approach. International Journal of Sociology and Social Policy. 2020, 40:1257-277. 10.1108/ijssp-12-2019-0262

7. Çalişkan MMT: The importance of “digital” financial literacy in digital economies and development strategies. Muhasebe. Serüven Publishing, 2024. 9:133-50.
8. Celestin M, Vanitha N: Financial inclusion 2.0: the impact of digital microfinance solutions on emerging markets. International Journal of Applied and Advanced Scientific Research. 2016, 1:161-66.
9. Chattopadhyay SK: Post-reform development of Banking Sector in India. Indian Economy: Reforms and Development. India Studies in Business and Economics. Biswas P, Das P (ed): Springer, Singapore; 2019. 1:209-51. 10.1007/978-981-13-8269-7_11
10. Goel A: An empirical study of Jan Dhan—Aadhaar—mobile trinity and financial inclusion. International Journal of Banking, Risk and Insurance. 2020, 7:62-79.
11. Golden W, Cordie L: Digital Financial Literacy. Adult Literacy Education: The International Journal of Literacy, Language, and Numeracy. 2022, 4:20-26. 10.35847/wgolden.lcordie.4.3.20
12. Hasan M, Le T, Hoque A: How does financial literacy impact on inclusive finance?. Financial Innovation. 2021, 7:40. 10.1186/s40854-021-00259-9
13. Kandie D, Islam KJ: A new era of microfinance: The digital microcredit and its impact on poverty. Journal of International Development. 2022, 34:469-92. 10.1002/jid.3607
14. Kulshrestha S: The role of financial technology in enhancing financial literacy and inclusion among low-income households in India. International Journal of Research in Marketing Management and Sales. 2023, 5:25-30. 10.33545/26633329.2023.v5.i1a.118
15. Kumar SK, Aithal PS: Influence of digital technology on microfinance sector: a study in Kerala. International Journal of Applied Engineering and Management Letters,. 2024, 8:186-97. 10.5281/zenodo.12623098
16. Kumar SK, and Aithal PS: From Access to Empowerment: The Role of Digital Microfinance - ABCD Evaluation. International Journal of Management Technology and Social Sciences. 2024, 9(2):267-282. 10.5281/ZENODO.12609017
17. Moin CM, Kraiwanit T: Digital improvements to microfinance in Bangladesh. International Research E-Journal on Business and Economics. 2023, 8:1-7.
18. Offiong UP, Szopik-Depczyńska K, Cheba K, Ioppolo G: FinTech as a digital innovation in microfinance companies - systematic literature review. European Journal of Innovation Management. 2024, 27:562-81. 10.1108/ejim-04-2024-0462
19. Okičić J, Jukan MK: Financial inclusion and digital financial literacy: the case of microfinance sector in Bosnia and Herzegovina. Financial Literacy in Today´s Global Market. Miciuła I (ed): IntechOpen, 2023. 1:1-25. 10.5772/intechopen.1002897
20. Omowole B, Urefe O, Mokogwu C: Building financial literacy programs within microfinance to empower low-income communities. International Journal of Engineering Research and Development. 2024, 20:1145-152.
21. Omowole BM, Urefe O, Mokogwu C, Ewim SE: Integrating fintech and innovation in microfinance: Transforming credit accessibility for small businesses. International Journal of Frontline Research and Reviews. 2024, 3:090-100. 10.56355/ijfrr.2024.3.1.0032
22. Pranatasari D, Rahmanto DNA, Wicaksana RS: Digital Islamic financial literacy and inclusion on profitability of micro, small and medium enterprises. NUsantara Islamic Economic Journal. 2021, 1:40-53. 10.34001/nuiej.v1i1.56
23. Yadav M, Banerji P: Systematic literature review on Digital Financial Literacy. SN Business & Economics. 2024, 4:142. 10.1007/s43546-024-00738-y
24. Yang J, Wu Y, Huang B: Digital finance and financial literacy: Evidence from Chinese households. Journal of Banking & Finance. 2023, 156:107005. 10.1016/j.jbankfin.2023.107005