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Financial Literacy, Financial Inclusion, and Digital Banking Initiatives among Rural Women: Evidence from Western Maharashtra

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Abstract:
Financial literacy, financial inclusion, and digital banking are critical for fostering inclusive economic growth and enhancing financial well-being, particularly in rural contexts. In India, a significant proportion of rural women continue to encounter barriers in accessing and utilizing formal financial services, despite the implementation of financial inclusion and digital banking programs. Key challenges include insufficient financial knowledge, limited digital skills, and low awareness of available financial products. This study investigates the interrelationships among financial literacy, financial inclusion, and digital banking initiatives among rural women in western Maharashtra. A quantitative research design was adopted, utilizing primary data collected through a structured questionnaire and analyzed using appropriate statistical techniques. The objectives are to evaluate the levels of financial literacy, the extent of financial inclusion, and the adoption of digital banking services among rural women. The findings are intended to inform policymakers, financial institutions, and development agencies in their efforts to enhance financial capability, promote digital financial services, and support sustainable rural development.

Keywords: Digital Banking Initiatives, Financial Inclusion, Financial Literacy, Rural Development, Rural Women, Western Maharashtra.

1. Introduction: Financial literacy, financial inclusion, and digital banking collectively constitute essential components of a robust financial system and are instrumental in promoting sustainable economic growth. Financial literacy equips individuals with the knowledge required to make informed financial decisions, while financial inclusion guarantees access to formal financial services for all segments of the population. Digital banking further enhances these aspects by increasing the accessibility, efficiency, and convenience of financial transactions through technological advancements. Collectively, these factors contribute to improved financial security, greater economic participation, and enhanced financial well-being.

India has made significant strides in expanding access to formal financial services through various inclusion initiatives and digital transaction platforms. However, the utilization of banking and digital financial services remains uneven, particularly among rural women.

Persistent challenges including limited financial knowledge, insufficient digital skills, low awareness of financial products, and socio-economic barrierscontinue to hinder their participation in the formal financial sector. Increased availability of financial services does not necessarily translate into effective usage. Given the critical role rural women play in managing household finances, supporting livelihoods, and contributing to community development, enhancing their financial skills and promoting digital banking adoption are essential for advancing financial inclusion and rural development. Examining the interplay among financial literacy, financial inclusion, and digital banking is especially important in regions characterized by diverse socio-economic conditions and varying degrees of financial access.

Despite extensive research on these topics, there is a paucity of empirical studies focusing on financial literacy, financial inclusion, and digital banking among rural women, particularly in western Maharashtra. This study seeks to address this gap by assessing financial literacy, financial inclusion, and the adoption of digital finance initiatives among rural women, as well as examining the interrelationships among these variables. The findings aim to offer evidence-based recommendations for policymakers, financial institutions, and development professionals to enhance financial capability and promote digital financial growth in rural India.

2. LITERATURE REVIEW: Scholars have carried out extensive research into financial literacy, financial inclusion, and digital banking because of their effect on inclusive economic growth and the financial well-being of households. Research has repeatedly shown that greater financial knowledge enables people to access formal financial services, and that digital banking has become a major factor in extending financial inclusion, particularly to those who are currently underserved.

Lusardi and Mitchell (2014) found that financial literacy is essential for making sound financial decisions. Their study found that people who had greater financial knowledge were more likely to save regularly, plan for retirement, and make well-informed financial choices, thus enhancing their long-term financial stability.

Atkinson and Messy (2012) presented a widely accepted method for assessing financial literacy, showing that financial knowledge, behaviour, and attitude all affect financial outcomes; their framework remains the basis for research into financial capability.

Cnaan and others (2021) examined financial inclusion in rural India and found that digital banking services have greatly increased access to formal banking. At the same time, they also mentioned that a shortage of digital skills and low levels of financial awareness still prevent people in rural areas from making effective use of these services.

Azeez and Akhtar (2021) investigated the factors that affect digital financial literacy in rural India. Their results show that people's level of education, their income, access to the internet, and awareness of digital tools all play an important role in the uptake of digital financial services. The study stressed the need to improve digital financial literacy to promote financial inclusion among these communities.

Kumar (2025) examined the relationship between digital banking and financial inclusion in rural India and found that digital transaction platforms have greatly enhanced access to financial services. However, problems that still exist such as inadequate digital infrastructure, low levels of financial literacy, and gender inequality continue to limit the overall effectiveness of the inclusion initiatives.

Aishwaryalaxmi and Rathod (2025) discovered that digital financial services promote positive financial behaviour, better decision making, and greater economic participation in rural areas. They suggested that digital banking developments should be combined with financial education programmes if the benefits of financial inclusion are to be fully realised.

Gracy and Devi (2025) examined how financial literacy influences women's decision to adopt online banking. Their research found that women with a higher level of financial literacy are more confident and more likely to use digital banking services. The study concluded that financial literacy is a major factor in encouraging women to take part in digital finance.

Keshari and Tiwari (2026) examined studies on financial inclusion. They concluded that rural areas still face obstacles, including unequal access to digital technology, a lack of financial skills, and socioeconomic disparities. They suggested that for financial inclusion to be sustainable, a combination of financial education, better digital infrastructure, and institutional support is necessary.

The literature review shows that financial literacy improves people's decision making and that digital banking increases access to formal financial services. However, most existing research has examined these factors individually or focused on the general population. Few studies have examined financial literacy, financial inclusion, and digital finance among rural women, especially in Western Maharashtra. The present study aims to address this gap by investigating how these three factors are related and by providing evidence that can be used for local policymaking and for promoting inclusive rural financial development.

3. Conceptual Framework: This research is based on the view that financial literacy and digital banking programmes are important for promoting financial inclusion among rural women. Financial literacy gives individuals the knowledge, skills, and confidence needed to make well-informed financial decisions. At the same time, digital banking provides simple, safe, and cost-effective methods of accessing formal financial services. By combining these two aspects, financial inclusion can be improved, as it leads to greater participation in savings, credit, insurance, pensions, and digital payment services.

In the framework in question, financial inclusion is the dependent variable, and financial literacy and digital banking initiatives are the independent variables. At the same time, demographic and socioeconomic factors are included as control variables to account for differences in financial behaviour and the use of financial services among rural women.

Figure 2.1

Conceptual Framework of the Study:

Digital Financial Literacy–Financial Inclusion Framework (DFL–FI Framework)

SocioEconomic Characteristics

Age ⇨ Education ⇨ Occupation ⇨ Income ⇨ Marital Status ⇨ Area of Residence

Digital Financial Literacy (DFL)
(Financial Knowledge • Financial Behaviour • Financial Attitude • Digital Skills)
⇩
Digital Financial Capability (DFC)
(Awareness • Confidence • Safe and Responsible Use)
⇩
Digital Financial Adoption (DFA)
(UPI • Mobile Banking • Internet Banking • AEPS • Digital Wallets • FinTech Services)
⇩
Financial Inclusion (FI)
(Access • Usage • Quality • Participation • Security)
⇩
Financial Empowerment of Rural Women

Source: Conceptual framework developed by Bharat Ravan (2026)

3.0 Theoretical Background: Financial literacy, financial inclusion, and the use of digital banking are all parts of financial empowerment, and together they influence a person's capacity to understand financial options, gain access to appropriate services, and use them with confidence and security.

3.1 Financial Literacy: Being financially literate involves possessing the awareness, knowledge, skills, attitudes, and behaviours necessary for making informed decisions regarding money. It includes the ability to prepare a budget, save money, invest, borrow responsibly, plan for insurance, manage risks, and use financial services safely. Financial literacy is particularly valuable for rural women since it enables them to look after their household finances, make decisions on their own, and avoid inappropriate products or financial scams.

3.2 Financial Inclusion: Financial inclusion means making sure that everyone is able, at an affordable price and in an effective way, to access services such as savings, credit, insurance, pensions, payments, and remittances. This goes beyond simply having a bank account to include regular use, high standards of service, consumer protection, and real participation in the formal financial sector. The India Financial Inclusion Index increased from 64.2 in March 2024 to 67.0 in March 2025, indicating improvements in access, usage, and quality, even though there are still differences in active use among people in rural areas and those from disadvantaged groups.

3.3 Digital Banking: Financial services can be obtained via various channels including mobile banking, internet banking, ATMs, UPI, BHIM, AePS, digital wallets, and other financial technologies. These platforms provide access around the clock, quicker transactions, reduced costs, and less need for physical bank branches. UPI facilitates instant transfers between banks, BHIM gives a simple payment interface based on UPI, and AePS allows banking transactions to be carried out using Aadhaar at local service centres, something which is especially important in rural areas.

Yet the fact that people have digital access does not ensure that they will actually use it; various factors such as owning a smartphone, having internet connectivity, facing language barriers, lacking confidence, being unaware of security measures, and having fraud concerns all influence how rural women adopt digital banking.

3.4 Financial Education and Inclusion Initiatives: The National Centre for Financial Education (NCFE), working with the RBI, SEBI, IRDAI and PFRDA, is in charge of financial education. The National Strategy for Financial Education 2020–2025 uses the 5C approach- Content, Capacity, Community-led Model, Communication, and Alliance to enhance financial skills among various groups.

Information on savings, loans, insurance, pensions, digital transactions, consumer rights, and how to avoid fraud is disseminated through RBI backed Financial Literacy Centres during Financial Literacy Week, as part of awareness campaigns, and through educational materials. These initiatives have been able to reach rural women thanks to the use of local languages, practical demonstrations, community involvement, and continued support.

The key inclusion schemes include PMJDY, which assists people in opening basic bank accounts and in gaining access to credit, insurance, pensions, and financial education; APY and NPS, which are aimed at retirement savings; and PMJJBY and PMSBY, which provide low cost life and accident insurance. PMJDY functions as a central platform for greater participation in formal banking and for receiving government benefits.

3.5 Relevance to the Present Study: Financial literacy enhances people's knowledge and decision making abilities, digital banking provides accessible means of using financial services, and financial inclusion ensures genuine access and usage. The way these three elements are connected can be described as:

Greater financial literacy results in increased digital confidence and safer use of digital services, which in turn promotes the adoption of digital financial services and advances financial inclusion, enabling rural women.

4. Research Objective: The primary aim of this study is to look at the role of financial literacy, financial inclusion, and online banking schemes in enhancing financial awareness, encouraging digital financial participation, and reinforcing the financial empowerment of rural women in western Maharashtra.

4.1 Research Question: How do financial literacy and electronic banking initiatives shape financial inclusion among rural women in Western Maharashtra?

5. Statement of the Problem: Even though there has been considerable advancement in financial inclusion and digital financial services in India, many rural women still have a low level of financial literacy, are not sufficiently aware of formal financial services, and face obstacles in effectively adopting digital banking. Since these issues prevent them from taking an active part in the formal financial system, it is necessary to examine how financial literacy and online banking programmes can enhance financial inclusion among rural women in Western Maharashtra.

6. Research hypotheses: H_1: states that greater financial literacy has a significantly positive effect on the adoption and effective use of digital financial innovations by rural women in Western Maharashtra.

7. Research Methodology: The research methodology provides the scientific framework that directs the systematic examination of the research problem. It includes details on the research design, the area of study, the target population, the method of sampling, the sources of data, the research tool, the way in which variables are measured, the assessment of reliability and validity, the ethical considerations, and the statistical techniques employed in the analysis of the data. By using a rigorous methodological approach, the reliability, validity, transparency, and replicability of the research findings are all enhanced. The current study uses a quantitative crosssectional research design to examine the role of financial literacy and electronic banking initiatives in promoting financial inclusion among rural women in Western Maharashtra.

3.1 Research Design: The study adopts a quantitative, descriptive, and analytical research design. The descriptive approach is used to assess the level of financial literacy, financial inclusion, and digital banking initiatives among rural women. In contrast, the analytical approach examines the relationships among the study variables. A crosssectional survey design was adopted because the data were collected from respondents at a single point in time.

3.2 Study Area: The study took place in Western Maharashtra, covering the five districts of Kolhapur, Sangli, Satara, Pune, and Solapur. This area is economically varied and has seen considerable growth in its banking infrastructure, digital payment systems, and financial inclusion initiatives. Yet differences in financial awareness, access to digital services, and the use of formal financial services among rural women remain, which is why the region is suitable for the present study.

3.3 The population of the study comprises rural women who live in the five districts of western Maharashtra, since rural women represent a key group of stakeholders in financial inclusion programmes and have an important role in household financial management, in terms of savings behaviour, and in the adoption of digital financial services.

3.4 Sample Size: The study is based on a sample of 450 rural women respondents. To ensure balanced geographical representation, 90 respondents were selected from each of the five districts: Kolhapur, Sangli, Satara, Pune, and Solapur. The sample size is considered adequate for descriptive and inferential statistical analyses.

3.5 Sampling Technique: A multistage sampling technique was adopted. In the first stage, the five districts of Western Maharashtra were selected. In the second stage, rural areas within each district were identified. Finally, respondents were selected through purposive and convenience sampling based on the objectives of the study and the availability of eligible participants.

3.6 Sources of Data: The study is based on both primary and secondary data. Primary data were collected using a structured questionnaire administered to rural women. Secondary data were obtained from publications and reports of the Reserve Bank of India (RBI), National Centre for Financial Education (NCFE), National Payments Corporation of India

(NPCI), Ministry of Finance, Census of India, research articles, books, government reports, policy documents, and other authentic academic sources.

3.7 Research Instrument: A structured questionnaire was developed after an extensive review of the relevant literature and the OECD/INFE Financial Literacy Framework. The instrument comprised four sections:

1. Demographic Profile:
2. Financial Literacy:
3. Digital Banking Initiatives:
4. Financial Inclusion:

The questionnaire had multiplechoice questions, yesorno answers, and statements rated on a fivepoint Likert scale. These aimed to find out what respondents think, know, and how they act.

3.8 Measurement of Variables: The study comprises three categories of variables.
Independent Variables:

- Financial Literacy:
- Digital Banking Initiatives:

Dependent Variable:

- Financial Inclusion:

Control Variables:

- Age:
- Educational Qualification:
- Occupation:
- Monthly Household Income:
- Marital Status:
- Area of Residence:

The study assessed financial literacy by looking at three areas: financial knowledge, financial behaviour, and financial attitude. To measure these aspects, the questionnaire contained questions taken from the OECD/INFE Financial Literacy Framework and from other similar validated tools, including multiple choice and Likert scale statements which tested people's understanding of basic banking terms, their numeracy skills, their day-to-day financial management, their budgeting habits, and their attitudes towards saving and borrowing. The digital banking initiatives were evaluated based on people's awareness of them, how easy it is to access them, the extent of their adoption and their use of digital financial services, with specific questions asking about the frequency of use, the types of digital banking platforms (such as UPI, mobile banking, internet banking, etc.), the ease with which they perceive these to be accessible, and their confidence in carrying out digital transactions safely. Financial inclusion was measured in terms of access to financial services, the way in which these services are used, digital transaction behaviour, savings habits, and participation in formal financial institutions, with questions covering account ownership, the regularity of account use, the variety of products and services available, participation in loans and savings, and involvement in financial schemes. The use of these specific measures improves the transparency and replicability of the assessment for future academic reference.

3.9 Reliability and Validity: The reliability of the research instrument was assessed using Cronbach's Alpha, with coefficient values above the recommended threshold indicating satisfactory internal consistency. Construct validity was examined using the KaiserMeyerOlkin

(KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity, confirming the suitability of the dataset for multivariate statistical analysis.

3.10 Statistical Techniques: The data that had been collected were given codes, compiled into tables, and then analysed using IBM SPSS Statistics. The following statistical techniques were used:

- Frequency Distribution:
- Percentage Analysis:
- Mean and Standard Deviation:
- Reliability Analysis: (Cronbach's Alpha)
- KMO and Bartlett's Test:
- Pearson Correlation Analysis:
- Multiple Linear Regression Analysis:
- Independent Samples tTest:
- OneWay Analysis of Variance: (ANOVA)
- Hypothesis Testing:

3.11 Ethical considerations: Taking part in the study was completely voluntary. Each respondent gave their informed consent before the data were collected. The anonymity and confidentiality of the participants were strictly maintained, and the information gathered was used only for academic and research purposes. The study followed the ethical principles generally accepted in the field of social science research, such as voluntary participation, the protection of privacy, and the responsible reporting of the findings.

4. Results and Analysis:

4.1 The demographic profile: This gives the background features of the respondents and helps in interpreting the variations in financial literacy, financial inclusion, and participation in digital banking. The study included 450 rural women from five districts in western Maharashtra, with equal representation from each district.

Table No. 4.1
Districtwise Distribution of Respondents:

Western Maharashtra District:		
District Name	**Total Sample Size**	**Percentage%**
1. Kolhapur	90	**20%**
2. Sangli	90	**20%**
3. Satara	90	**20%**
4. Pune	90	**20%**
5. Solapur	90	**20%**
Total	**450**	**100%**

(Source: Primary survey data)

The demographic features of the 450 rural women who were surveyed in five districts of western Maharashtra are given in Table 4.1. The sample included an equal number of women from Kolhapur, Sangli, Satara, Pune, and Solapur. A majority of the respondents were under 40 years of age (68.00%), just over half were married (48.89%), and the largest group in terms of occupation was private salaried employees (34.44%); after them came daily wage labourers (26.89%). About 77% of respondents came from households with a monthly income of up to ₹15,000, indicating that the population is mainly composed of people from low to middle income groups. Moreover, more than half of the respondents (56.22%) lived in their own houses. Taken as a whole, the demographic profile shows a diverse yet economically representative sample of rural women. It thus provides a suitable foundation for examining financial literacy, digital banking initiatives, and financial inclusion in western Maharashtra.

4.2 Financial Literacy:

Table No. 4.2

Financial Literacy Indicators among Rural Women:

Sr. No.	Indicator	Positive Response (n)	Percentage (%)	Level
1	Bank Account Ownership	331	73.56	**High**
2	Regular Savings	286	63.56	**Moderate**
3	Government Financial Scheme Awareness	271	60.22	**Moderate**
4	Investment Awareness	212	47.11	**Low**

(Source: Calculated from the data collected during the Primary Survey)

The study indicates that bank account ownership (73.56%) and regular saving practices (63.56%) are relatively high among rural women. However, investment awareness remains comparatively low (47.11%), and awareness of government financial schemes is moderate (60.22%). Overall, these findings suggest that while access to basic financial services is adequate, there is a continued need to enhance financial knowledge and investment awareness.

4.3 Digital Banking Initiative among Rural Women:

Table No. 4.3

Digital Banking Initiative Indicators among Rural Women: (N=450)

Sr. No.	Digital Banking Initiative	Positive Response (n)	Percentage (%)	Level	Rank
1.	UPI/Digital Payment Usage	384	85.33	**Very High**	I
2.	ATM Card Usage	308	68.44	**High**	II
3.	Awareness of Digital	292	64.89	**Moderate**	III
4.	Debit Card Usage	261	58.00	**Moderate**	IV
5.	Confidence in Using Digital Banking	248	55.11	**Moderate**	V
6.	Mobile Banking Usage	234	52.00	**Moderate**	VI
7.	Internet Banking Usage	207	46.00	**Low**	VII
Overall	**Mean Percentage**		**61.40**	**Moderate**	

(Source: Computed from Primary Survey Data)

4. Digital Banking Adoption among Rural women:

Table No. 4.4
Digital Banking Adoption Index among Rural Women: (N=450)

Sr. No.	Dimension	Score (%)	Interpretation
1	Digital Payment Usage (UPI/Digital Payments)	85.33	**Very High**
2	Digital Banking Access (ATM, Debit Card, Mobile Banking & Internet Banking)	56.11	**Moderate**
3	Digital Banking Awareness	64.89	**High**
4	Digital Banking Confidence	55.11	**Moderate**
Overall Digital Banking Adoption Index		**65.36**	**High**

(Source: Calculated from the data collected during the Primary Survey)

- **Digital Banking Access Index** = (68.44 + 58.00 + 52.00 + 46.00) ÷ 4 = **56.11%**
- **Overall Digital Banking Adoption Index** = (85.33 + 56.11 + 64.89 + 55.11) ÷ 4 = **65.36%**

The Digital Banking Adoption Index demonstrates that rural women exhibit a relatively high overall adoption of digital banking (65.36%). Digital payment usage is the most prominent component (85.33%), while digital banking access (56.11%) and confidence in using digital banking services (55.11%) remain lower. These results indicate that, although digital payment platforms are widely utilized, further efforts are required to enhance access to and confidence in a broader range of digital banking services.

5. Descriptive Statistics of the Major Study Variables:

Table No. 4.5
Descriptive Statistics of the Major Study Variables: (N=450)

Variable	Number of Items	Mean	Standard Deviation	Minimum	Maximum
Financial Literacy	39	64.46	12.84	28.75	92.50
Digital Banking Initiatives	7	65.36	14.27	20.00	100.00
Financial Inclusion	12	68.91	13.18	30.00	96.00

(Source: Computed from Primary Survey Data using SPSS)

Descriptive statistics reveal that respondents exhibited a moderate level of financial literacy (Mean = 64.46, SD = 12.84), as well as moderately high levels of digital banking adoption (Mean = 65.36, SD = 14.27) and financial inclusion (Mean = 68.91, SD = 13.18). The standard deviation values indicate moderate variability in scores across these three variables.

6. Reliability Analysis:

Table No. 4.6
Reliability Analysis of the Study Variables:

Variable	No. of Items	Cronbach's Alpha	Interpretation
Financial Literacy	20	0.884	Excellent Reliability
Digital Banking Initiatives	7	0.861	Good Reliability
Financial Inclusion	15	0.903	Excellent Reliability
Overall Questionnaire	42	0.892	Highly Reliable

(Source: SPSS Output)

Cronbach's Alpha values exceed the recommended threshold of 0.70, indicating that the questionnaire demonstrates strong internal consistency and is suitable for subsequent statistical analysis.

7. **Correlation Matrix among the Study Variables: (N = 450)**

Table No. 4.7

Variables	**Financial Literacy**	**Digital Banking Initiatives**	**Financial Inclusion**
Financial Literacy	1.000		
Digital Banking Initiatives	0.684	1.000	
Financial Inclusion	0.731	0.692	1.000

(Source: Computed from Primary Survey Data using SPSS)

- **The correlation is significant at the 0.01 level (two-tailed).**
- **Method: Pearson's ProductMoment Correlation.**
- **Sample Size (N): 450.**

Correlation analysis reveals positive and statistically significant relationships among all three study variables. Financial literacy is strongly correlated with financial inclusion ($r = 0.731$, $p < 0.01$), indicating that higher financial literacy is associated with greater financial inclusion. Financial literacy is also positively associated with digital banking initiatives ($r = 0.684$, $p < 0.01$), suggesting that financially literate women are more likely to adopt digital banking services. Additionally, digital banking initiatives are positively correlated with financial inclusion ($r = 0.692$, $p < 0.01$), indicating that increased use of digital banking corresponds with higher financial inclusion among rural women.

8. **Model Summary of Multiple Regression Analysis: (N = 450)**

Table No. 4.8

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	**0.782**	**0.611**	**0.607**	**0.432**

(Computed from the primary survey data using SPSS)

- **Dependent Variable: Financial Inclusion**
- **Predictors: Financial Literacy, Digital Banking Initiatives**

Regression analysis produced a correlation coefficient **($R = 0.782$),** indicating a strong relationship between the independent variables and financial inclusion. The coefficient of determination **($R^2 = 0.611$) demonstrates that 61.1%** of the variation in financial inclusion is explained by financial literacy and digital banking initiatives. **The adjusted R^2 (0.607)** confirms the model's substantial explanatory power after accounting for the number of predictors. The **standard error of the estimate (0.432)** suggests a satisfactory model fit. These results confirm that financial literacy and digital banking initiatives are significant predictors of financial inclusion among rural women.

4.9 ANOVA for Multiple Regression Model: ANOVA helps check if the regression model fits the data well. It splits the total variation in the dependent variable into parts: variation explained by the regression and variation explained by error.

In a multiple regression, ANOVA tests whether at least one predictor is related to the dependent variable. The model’s F-statistic compares the explained variation to the unexplained variation. A large F-statistic and a small p-value mean the regression model is useful.

The ANOVA table for multiple regression includes these parts:

- **Regression sum of squares (SSR): variation explained by the model.**
- **Error sum of squares (SSE): variation not explained by the model.**
- **Total sum of squares (SST): total variation in the dependent variable.**

Degrees of freedom for regression is the number of predictors. For error, it is the sample size minus the number of predictors minus one. Total degrees of freedom is the sample size minus one.

The F-statistic is calculated by dividing the mean square regression by the mean square error. If the F-statistic is significant, at least one predictor helps explain the dependent variable.

4.9 ANOVA for Multiple Regression Model:

Table 4.9

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	132.468	2	66.234	354.82	<0.001
Residual	83.532	447	0.187		
Total	216.000	449			

The ANOVA results show that the regression model is statistically significant ($F = 354.82$, $p < 0.001$); hence, it offers a good fit for explaining financial inclusion based on financial literacy and digital banking initiatives.

4.10 Regression Coefficients:

Table 4.10

Predictor	Unstandardized Coefficient (B)	Std. Error	Standardized Beta (β)	tvalue	Sig.
(Constant)	0.821	0.214		3.84	<0.001
Financial Literacy	0.493	0.042	0.512	11.82	<0.001
Digital Banking Initiatives	0.387	0.043	0.401	8.94	<0.001

The regression coefficients indicate that both financial literacy ($\beta = 0.512$, $p < 0.001$) and digital banking initiatives ($\beta = 0.401$, $p < 0.001$) exert positive and statistically significant effects on financial inclusion. Financial literacy demonstrates a greater impact than digital banking initiatives, suggesting that enhancing financial knowledge and skills is likely to contribute more substantially to improving financial inclusion among rural women.

4.11 Hypothesis Testing:

Summary of Hypothesis Testing Results (N = 450)

Table No. 4.11

Hypothesis	Statement	Statistical Test	Test Value	pvalue	Decision
H_1	Financial literacy is positively associated with digital banking initiatives.	Pearson Correlation	r = 0.684	< 0.001	**Accepted**
H_2	Financial literacy is positively associated with financial inclusion.	Pearson Correlation	r = 0.731	< 0.001	**Accepted**

H_3	Digital banking initiatives are positively associated with financial inclusion.	Pearson Correlation	r = 0.692	< 0.001	**Accepted**
H_4	Financial literacy and digital banking initiatives significantly predict financial inclusion.	Multiple Regression	R^2 = 0.611; F = 354.82	< 0.001	**Accepted**

(Source: Computed from Primary Survey Data using SPSS)

The hypothesis testing results demonstrate that all four research hypotheses are supported. Financial literacy exhibits a strong positive relationship with both digital banking initiatives and financial inclusion, while digital banking initiatives are also positively associated with financial inclusion. Furthermore, the multiple regression analysis confirms that financial literacy and digital banking initiatives jointly explain 61.1% of the variation in financial inclusion (R^2 = 0.611), indicating that both variables are significant predictors of financial inclusion among rural women.

4.12 ChiSquare Test Showing the Association between Financial Literacy and Digital Banking Initiatives (N = 450)

- **Hypotheses:**

H_0: There is no significant association between financial literacy and digital banking initiatives among rural women.
H_1: There is a significant association between financial literacy and digital banking initiatives among rural women.

Table 4.12

Test Statistic	Value	df	Asymptotic Significance (2sided)	Decision
Pearson ChiSquare (χ^2)	8.008	3	0.046	**Reject H_0**
Likelihood Ratio	8.181	3	0.042	**Reject H_0**
LinearbyLinear Association	7.814	1	0.005	**Reject H_0**
Fisher's Exact Test	7.920		0.047	**Reject H_0**
Valid Cases	**450**			

(Source: Computed from Primary Survey Data using SPSS)

A chisquare analysis shows a statistically significant association between financial literacy and the uptake of digital banking by rural women. The Pearson Chisquare statistic (χ^2 = 8.008, df = 3, p = 0.046) is significant at the 5% level, which means that financial literacy is linked to the adoption of digital banking. Both the Likelihood Ratio (χ^2 = 8.181, p = 0.042) and Fisher's Exact Test (p = 0.047) also confirm this finding. Moreover, the Linear-by-Linear Association (χ^2 = 7.814, p = 0.005) shows a significant positive linear trend, implying that as financial literacy increases, there is also greater adoption of digital banking initiatives.

The null hypothesis (H_0) is rejected because the pvalue (0.046) is below the 0.05 level of significance, and as a result, the alternative hypothesis (H_1) is accepted.

The results show that there is a statistically significant positive relationship between financial literacy and involvement in digital banking among rural women in western Maharashtra, indicating that women who have a higher degree of financial literacy are more likely to adopt and make use of digital banking services and thus underscoring the value of financial education for promoting digital financial inclusion.

4.13 Findings: The main findings of the study are summarised in the following way:

Financial Literacy:

1. The financial literacy of rural women as a whole was 64.46 per cent, which shows a moderate level of financial literacy.
2. A comparative assessment showed that the respondents had a better understanding of basic banking services than of more advanced financial products.
3. The level of financial literacy among the respondents varied, which indicates that financial education programmes should be aimed at specific groups.

Digital Banking Initiatives:

1. The overall Digital Banking Adoption Index was 65.36%, indicating a moderately high level of digital banking adoption.
2. UPI/Digital Payment Usage (85.33%) was the most widely adopted digital banking service.
3. ATM Card Usage (68.44%) and Digital Banking/Internet Banking Usage (46.00%) were the digital banking services with the lowest level of adoption, which shows that people generally make limited use of more advanced online banking facilities. The people surveyed showed a moderate level of confidence (55.11%) when it came to using digital banking services, which shows that there is still a need for ongoing digital financial education. This highlights the need for continuous digital financial education.

Financial Inclusion:

1. The overall financial inclusion score was 68.91%, indicating that respondents had a m. Financial inclusion increased for respondents with higher financial literacy and greater use of digital banking services. Financial literacy and greater use of digital banking services were associated.

Correlation Analysis:

1. Financial literacy was positively and significantly associated with digital banking initiatives ($r = 0.684$, $p < 0.001$).
2. Financial literacy exhibited a strong positive relationship with financial inclusion ($r = 0.731$, $p < 0.001$).
3. Digital banking initiatives also showed a significant positive relationship with financial inclusion ($r = 0.692$, $p < 0.001$).

Multiple Regression Analysis:

1. Financial literacy and digital banking initiatives jointly explained 61.1% of the variation in financial inclusion ($R^2 = 0.611$).
2. The regression model was statistically significant ($F = 354.82$, $p < 0.001$), confirming that both variables are important predictors of financial inclusion.

Hypothesis Testing:

1. The Chisquare test indicated a statistically significant association between financial literacy and digital banking initiatives ($\chi^2 = 8.008$, $p = 0.046$).
2. The empirical analysis supported all research hypotheses.
3. The study demonstrates that higher levels of financial literacy are associated with increased use of digital banking services, which in turn leads to improved financial inclusion among rural women.

Empirical evidence shows that financial literacy forms the basis of digital financial participation, while digital banking programmes serve as a key means of improving financial inclusion. The combined impact of these factors greatly increases the financial empowerment of rural women in western Maharashtra, highlighting the need to combine financial education with digital financial services in future policy measures.

This study looked at the relationships between financial literacy, digital banking initiatives, and financial inclusion among rural women in western Maharashtra. The results show that financial literacy has a significant impact on both the adoption of digital banking and financial inclusion; respondents with higher financial literacy used digital banking services more and had better access to formal financial products and services.

The results also show that digital banking initiatives have a positive and statistically significant relationship with financial inclusion. The widespread adoption of UPI and digital payment platforms suggests that digital financial technologies have become an important means of improving access to financial services in rural areas. At the same time, the relatively low scores for internet banking usage and digital banking confidence point to barriers related to digital skills, awareness, and trust that still affect the effective use of more advanced banking services.

The study's findings show that although the Government of India and the Reserve Bank of India have introduced several measures, including the Pradhan Mantri Jan Dhan Yojana (PMJDY), Financial Literacy Centres (FLCs), the Digital India Campaign, and the Unified Payments Interface (UPI), the real impact has still been uneven.

The regression analysis shows that financial literacy and digital banking initiatives together account for 61.1 per cent of the variation in financial inclusion ($R^2 = 0.611$). This result shows that it is possible to considerably enhance financial inclusion among rural women by improving their financial knowledge and by promoting digital banking services. The findings indicate that financial literacy forms the basis of effective financial decisionmaking. On the other hand, digital banking initiatives make it easier for people to access formal financial services. Taken together, these factors make a significant contribution to improving financial inclusion and to advancing the economic empowerment of rural women.

This study examined the impact of financial literacy and digital banking programs on financial inclusion among rural women in western Maharashtra. The findings indicate that respondents possess a moderate level of financial literacy and digital banking adoption, while their level of financial inclusion is comparatively higher. Among digital banking components, digital payment usage emerged as the most prominent, whereas internet banking usage and confidence in digital financial services remained relatively low.

The correlation analysis showed significant positive relationships between financial literacy, digital banking initiatives, and financial inclusion; it revealed that better financial literacy is linked to a higher level of adoption of digital banking services and to improved financial inclusion, and similarly, greater use of digital banking services has a positive effect on financial inclusion.

The regression analysis involving multiple variables also showed that financial literacy and digital banking initiatives together account for 61.1% of the variation in financial inclusion. This indicates that both of these factors are significant determinants of financial inclusion for rural women. Moreover, the Chisquare analysis found a statistically significant association between financial literacy and digital banking initiatives, underscoring the importance of financial knowledge in encouraging the use of digital financial services.

In summary, the study concludes that enhancing financial literacy and expanding digital banking initiatives can significantly increase financial inclusion among rural women. Investments in financial education, digital infrastructure, and awareness campaigns enable women to access and effectively utilize formal financial services, thereby contributing to inclusive and sustainable rural development. The research highlights the critical interconnection between financial literacy, financial inclusion, and digital banking in achieving inclusive economic growth. Financial literacy provides individuals with the knowledge, skills, and confidence necessary for responsible financial decision making. Financial inclusion ensures that all segments of society, especially marginalized and low income rural populations, have access to affordable and appropriate financial products and services. Digital banking acts as a transformative mechanism, advancing financial inclusion through technological innovation, efficiency, and convenience.

4.15 Limitations of the Study:

It is important to acknowledge certain limitations of this study. Nonetheless, the research provides valuable insights into the relationships among financial literacy, digital banking initiatives, and financial inclusion among rural women.

The research focused only on certain districts in Western Maharashtra; as a result, its findings cannot be applied to other parts of India which have different socioeconomic, cultural, or infrastructural features. Differences between regions, including variations in literacy levels, local customs, people's attitudes towards financial services, language difficulties, and inequalities in digital infrastructure and connectivity, can significantly affect both the uptake and the effectiveness of financial literacy and digital banking programmes. To overcome these limitations, future studies could involve a wider and more diverse geographical sample, carry out comparative analyses between different states or regions, or use a longitudinal research design to examine changes over time. These methods would improve the generalizability and practical relevance of the results for a broader context.

The study used a cross-sectional approach, which meant that it recorded people's views and behaviours at one point in time. As a result, it was not possible to examine how financial literacy and the adoption of digital banking have changed over time. Future research should adopt a longitudinal or panel study design to monitor changes in financial literacy, digital banking adoption, and financial inclusion over time. This would enable a more solid analysis of causal relationships and increase the policy relevance of the findings. The analysis was mainly based on information given by individuals, although this type of data can be affected by recall bias or social desirability bias.

The study looked at financial literacy and digital banking initiatives as the main factors affecting financial inclusion. However, it is necessary to acknowledge that other factors such as financial attitude, financial behaviour, digital infrastructure, financial self efficacy, and institutional support were not included in the regression model. If these omitted variables were added in future research, this could lead to a more thorough understanding of the factors that influence financial inclusion among rural women. Such variables might show additional relationships or moderating effects, thus improving the robustness and explanatory power of future studies in this area.

Even though the statistics based on 450 respondents are reliable, the external validity of the results could be improved by increasing the sample to include other states or regions.

4.16 Contribution of the Study:

This study contributes to the existing literature by providing empirical evidence on the interrelationship among financial literacy, digital banking initiatives, and financial inclusion among rural women in Western Maharashtra. The results demonstrate that both financial literacy and digital banking adoption are significant determinants of financial inclusion and offer practical recommendations for policymakers, financial institutions, and development agencies to strengthen inclusive financial systems. Additionally, the findings present a valuable framework for future research on women's financial empowerment and digital financial inclusion in developing economies.

Future research might build on this study by asking specific questions such as: What is the effect of financial literacy and the use of digital banking on the longterm financial wellbeing and resilience of rural women over time? What different impacts do financial inclusion programmes have according to age groups, castes, or occupational categories among rural women? Moreover, further research should examine the specific difficulties that women in other parts of India, for example in the NorthEast or in tribal areas, face and evaluate the effectiveness of targeted financial education initiatives. Longitudinal studies that monitor changes in financial literacy, digital banking adoption, and financial inclusion would be useful in identifying causal links and in showing trends over time. Future research should also investigate how emerging financial technologies (for example, digital microcredit, insuretech, or savings platforms) affect the economic participation and empowerment of rural women.

4.17 Suggestions

Financial literacy must be included in both the formal education system and in community-based learning programs. Financial education introduced at the school and college levels will help build people's financial awareness, their ability to prepare budgets, and their habits of responsible financial management from an early age. Informal education activities, for example, workshops organised by SelfHelp Groups (SHGs), NGOs, and Panchayat institutions, can reach adults and people in rural areas who are not part of the formal education system. Such programs should focus on practical subjects like saving, credit management, insurance, and secure digital transactions. Adopting this twopronged approach will enable financial literacy to be widely spread.

It is also necessary to improve internet connectivity, expand mobile network coverage, and set up more digital service centres to promote the use of digital banking. Banks and fintech companies should create mobile applications that are easy for users to use, designed for regional languages, and include simple interfaces, visual symbols, and voice guidance for those with low literacy levels. Moreover, regular awareness campaigns concerning cybersecurity and the prevention of digital fraud are essential if trust and confidence are to be established, thus leading to greater uptake of digital banking services.

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