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# MODELING THE POWER OF FINTECH-DRIVEN MICROFINANCE ON WOMEN'S EMPOWERMENT: A SEM-BASED ANALYSIS OF SHG MEMBERS IN KHURDA AND SAMBALPUR DISTRICTS

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**Abstract**
This endeavor revolves around the effect of Fin Tech-enabled microfinance involvement on women's financial empowerment within Self-Help Group (SHG) members in Khurda and Sambalpur districts of Odisha. Depending on primary data gathered from 260 respondents, the work implements extensive statistics, Chi-square trials, correlation, regression analysis, and Structural Equation Modeling (SEM), with data evaluation carried out considering SPSS 27 and SEM measures. The outcomes reveal that the collaboration with Fin Tech profoundly promotes digital financial knowledge, financial adoption, and access to credit, thereby improving women's financial outcomes. Furthermore, the SEM outcomes insist, financial adoption and credit accessibility act as crucial mediating variables in reinforcing empowerment. The work signifies the vitality of combining FinTech novelties with SHG-dependent microfinance schemes to encourage comprehensive financial advancement and foster women's economic independence in rural and semi-urban areas.

**Keywords**
FinTech, Microfinance, Women's Financial Empowerment, Self-Help Groups (SHGs), Financial Adoption, Digital Financial Knowledge, Credit Accessibility, Structural Equation Modeling (SEM)

## INTRODUCTION

FinTech-driven microfinance significantly reinforces women's empowerment via encouraging access to credit, promoting financial knowledge, and supporting MSME execution within SHG affiliates. The modeling outcomes represent that FinTech adoption nurtures financial and advertising novelty, which indirectly confronted to better-quality economic consequences. However, the usefulness of these profits relies on capacity-building initiatives which resolve scientific constraints and encourages sustainable fiscal practices within women entrepreneurs (Bedaduri et al. 2025). Fin Tech-driven microfinance has evolved as a transformative measure in give rise to financial adoption, operational efficiency, and digital innovation within microfinance schemes. Modeling its effect exhibits strong potential to promote women's empowerment via growing access to monetary provisions and reinforces decision-making abilities. However, further research is needed to experience the real time drivers of FinTech adoption and its long-term implications for sustainable empowerment outcomes (Offing et al. 2024).

## OBJECTIVES

- To examine the effect of FinTech-enabled microfinance participation on digital financial literacy among SHG members.
- To analyse the relationship between digital financial literacy and financial inclusion among women.
- To assess the influence of financial inclusion on access to credit for SHG members.
- To evaluate the impact of access to credit on women's economic empowerment.
- To determine the effect of FinTech-enabled microfinance participation on financial adoption.
- To examine the direct impact of FinTech-enabled microfinance participation on women's economic empowerment.

## HYPOTHESIS

**H1:** FinTech-enabled microfinance participation has a significant positive effect on digital financial literacy among SHG members.
**H2:** Digital financial literacy has a significant positive effect on financial inclusion among women.
**H3:** Financial inclusion has a significant positive effect on access to credit for SHG members.
**H4:** Access to credit has a significant positive effect on women's economic empowerment.
**H5:** FinTech-enabled microfinance participation has a significant positive effect on financial adoption.
**H6:** FinTech-enabled microfinance participation has a significant positive effect on women's economic empowerment.

## LITERATURE REVIEW

Fin Tech-driven microfinance serves as a motivating agent towards women's empowerment by enhancing financial inclusion, reducing inequalities, and enabling access to innovative financial services. Modeling its impact highlights how digital technologies improve credit accessibility, financial decision-making, and economic participation among women. However, the sustainability of these outcomes depends on addressing digital divides, regulatory challenges, and ethical concerns in technology adoption (Benedetti & Calderón, 2025). Fin Tech-driven financial inclusion, combined with alternative banking mechanisms, plays a significant role in addressing resource access and socio-economic challenges. Modeling its impact in a microfinance context suggests that improved financial access can enhance women's economic empowerment by reducing financial constraints and enabling productive investments. The findings also indicate that broader structural factors influence.
outcomes, highlighting the need for integrated financial and policy interventions to achieve sustainable empowerment (Ramaian Vasantha et al. 2026). FinTech-driven microfinance exerts a pivotal role in advancing financial adoption by reducing barriers to monetary access and enhancing service delivery for underserved populations, particularly women. Modeling its impact shows that digital financial measures namely mobile banking and alternative credit systems significantly improve women's access to finance, entrepreneurial opportunities, and economic participation. However, achieving sustainable empowerment requires addressing challenges related to financial literacy, infrastructure gaps, and regulatory frameworks (Harish et al. 2025). FinTech-driven microfinance emerges as a key enabler of entrepreneurial growth by facilitating access to finance, digital platforms, and innovative business opportunities for women. Modeling its impact highlights how FinTech adoption strengthens women's economic empowerment through enhanced enterprise performance and financial inclusion. The findings also emphasize the need for gender-focused FinTech policies and targeted support mechanisms to sustain empowerment outcomes in diverse socio-economic contexts (Bhullar et al. 2025). Financial literacy plays a critical role in driving FinTech adoption within microfinance services, thereby influencing access to digital financial tools among underserved populations. Modeling the impact suggests that enhanced FinTech adoption, supported by financial literacy, significantly contributes to women's economic empowerment through improved financial access and decision-making. The findings also highlight the intermediating part of monetary literacy in strengthening the association between microfinance participation and empowerment outcomes (Hasan et al. 2024). Smartphone-enabled FinTech adoption enhances digital financial literacy and expands access to fiscal services, creating new prospects toward women's financial involvement. Modeling its impact shows that improved digital literacy significantly strengthens the effectiveness of FinTech-driven microfinance in empowering women through better financial decision-making and inclusion. The outcomes emphasize the importance of accessible technologies and supportive regulatory frameworks to achieve sustainable empowerment outcomes (Alqirem & Al-Smadi, 2025).

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## RESEARCH GAP

There are various research lack persists, despite of the growing literature contexts presenting the optimistic part of FinTech-driven microfinance encouraging financial adoption, innovation, and women's financial empowerment. First, the recent works extensively laid out generalized or macro-level intuitions, comprising exclusive numerical fact directed towards on foundational SHG networks in Khurda and Sambalpur districts of Odisha. Second, there are inadequate modelling towards simultaneous interactions and mediating impacts considering robust measure like SEM in the paradigm of financial literacy, adoption of digital access, and the on-going policy support mindset. Third, there is a lack in prevalence of Fintech adoption real time impact across socio-economic and demographic extents within SHGs. In addition, it is a kind of restrict access towards the incorporation of digital financial literacy, credit approachability, along with financial adoption into an integrated susceptible mass expanding empowerment consequence. In order to resolve the aforesaid gaps, a SEM-based model completely look into the pathways through which FinTech-driven microfinance impacts women's economic empowerment at the micro level has been fabricated.

## CONCEPTUAL FRAMEWORK

### Proposed SEM Model Structure

**The proposed conceptual framework towards SEM analysis has been laid underneath in figure-1.**

**Exogenous Variable-** Fin Tech-enabled Microfinance Participation

**Mediating Variables-** Digital Financial Knowledge, Financial Adoption, Access to Credit

**Endogenous Variable-** Women's Economic Empowerment

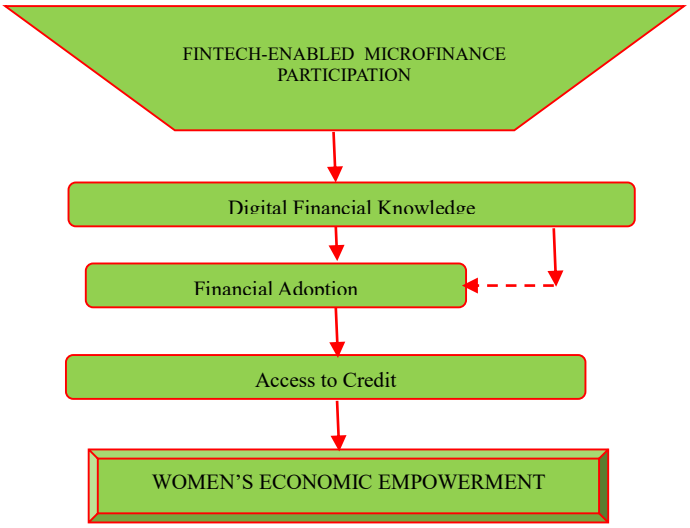


Fig. 1: Conceptual framework model for SEM analysis

The model assumes that FinTech tools such as mobile banking, digital payments, and online loan access strengthen financial inclusion and improve economic independence among SHG members. The conceptual framework illustrates the structural relationships between FinTech-enabled microfinance participation and women's financial empowerment among Self-Help Group (SHG) members. The framework assumes that digital financial literacy, financial inclusion, and access to credit act as mediating mechanisms through which FinTech participation influences economic empowerment. The model is empirically verified considering data accumulated from SHG members in Khurda and Sambalpur in Odisha.

## RESEARCH METHODOLOGY

The present work adopts a numerical study design to look into the role of FinTech-enabled microfinance participation in influencing women's economic outcomes through Self-Help Groups (SHGs). Primary data were gathered from 260 women participants belonging to 16 Self-Help Groups located in the districts of Khurda and Sambalpur, which represent both coastal and western regions of Odisha. The participants were chosen considering a purposive sampling idea, focusing on SHG members actively engaged in microfinance and digital financial services. An organised questionnaire has been set up to collect information concern with socio-economic aspects, microfinance involvement, FinTech exposure, and perceived financial empowerment. The observation included both demographic variables and Likert-scale counts which become crucial features of the work The questionnaire has been reviewed and distinguished certifying precision and importance of the items, before to the ultimate inspection occurred. Data has acquired via face-to-face discussions with the respondents to ensure better understanding of the questions and to yield consistent responses. The accumulated data has coded and entered into numerical software measure for observation. Initially, descriptive statistics and pivot table analysis have worked to review the demographic features of participants and to present the distribution of responses across different variables. The Chi-square trial has been laid out to verify the association within categorical features. In addition, correlation study was conducted to measure the power and course of associations within key study measures. These preliminary statistical techniques provided insights into patterns of association within the dataset.Further, to validate the conceptual framework and trial the hypothesized link among measures, Structural Equation Modelling (SEM) was activated. SEM enables simultaneous examination of multiple relationships between latent and observed variables and provides model fit indices to estimate the overall competence of the planned framework. The aspects like reliability and validity of the measures were estimated considering appropriate measures before performing the structural model analysis. The combined use of descriptive statistics, inferential tests, and SEM provides a comprehensive analytical approach for understanding the influence of FinTech-enabled microfinance participation on women's economic empowerment within SHGs.

**Table 1: Measurement Scale of Variables**

| Construct | Measurement Indicators | Scale Type |
|---|---|---|
| FinTech-enabled Microfinance Participation | Use of mobile banking, digital payment usage, access to online microfinance services, digital loan transactions | 5-point Likert Scale |
| Digital Financial Literacy | Ability to use digital financial tools, awareness of online financial services, confidence in digital transactions | 5-point Likert Scale |
| Financial Inclusion | Access to formal financial services, savings accounts, digital transaction facilities | 5-point Likert Scale |
| Access to Credit | Availability of microfinance loans, ease of obtaining credit, frequency of loan usage | 5-point Likert Scale |
| Women's Economic Empowerment | Income improvement, financial decision-making ability, savings behaviour, economic independence | 5-point Likert Scale |

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
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Measurement Model: The reliability and validity of the constructs have assessed considering the underneath measures:

- **Cronbach's Alpha** (>0.70)
- **Composite Reliability (CR)** (>0.70)
- **Average Variance Extracted (AVE)** (>0.50)
- **Factor Loadings** (>0.60)

**DEMOGRAPHIC PROFILE OF SAMPLE RESPONDENTS**

**Table-2: District -wise classification**

| Category | Frequency | Percentage (%) |
|---|---|---|
| Khurda | 160 | 61.5 |
| Sambalpur | 100 | 38.5 |
| **Total** | **260** | **100.0** |

**Interpretation**: The district-wise classification shows that a majority of the respondents belong to Khurda district, accounting for 61.5% (160 respondents), while 38.5% (100 respondents) are from Sambalpur district. This indicates that the study sample is more concentrated in Khurda compared to Sambalpur.

**Table-3: Age- wise classification**

| Category | Frequency | Percentage (%) |
|---|---|---|
| 20–30 years | 48 | 18.5 |
| 31–40 years | 96 | 36.9 |
| 41–50 years | 72 | 27.7 |
| Above 50 | 44 | 16.9 |
| **Total** | **260** | **100.0** |

**Interpretation:** Most respondents are aged 31–40 years (36.9%), followed by 41–50 years (27.7%). Fewer respondents fall in the 20–30 years (18.5%) and above 50 years (16.9%) groups, indicating a concentration in the middle age group.

**Table-4: Education- wise classification**

| Category | Frequency | Percentage (%) |
|---|---|---|
| Primary | 62 | 23.8 |
| Secondary | 108 | 41.5 |
| Higher Secondary | 58 | 22.3 |
| Graduate | 32 | 12.3 |
| **Total** | **260** | **100.0** |

**Interpretation:**Most respondents have secondary education (41.5%), followed by primary (23.8%) and higher secondary (22.3%), while a smaller proportion are graduates (12.3%), indicating that the majority have education up to the secondary level.

**Table-5: Marital Status- wise classification**

| Category | Frequency | \Percentage (%) |
|---|---|---|
| Married | 218 | 83.8 |
| Unmarried/Widowed | 42 | 16.2 |
| **Total** | **260** | **100.0** |

**Interpretation:**The majority of respondents are married (83.8%), while only 16.2% are unmarried or widowed, indicating a strong predominance of married individuals in the sample.

**Table-6: SHG Membership Duration- wise classification**

| Category | Frequency | Percentage (%) |
|---|---|---|
| Below 3 years | 54 | 20.8 |
| 3–5 years | 102 | 39.2 |
| Above 5 years | 104 | 40.0 |
| **Total** | **260** | **100.0** |

**Interpretation:**

Most respondents have been SHG members for above 5 years (40.0%), followed closely by those with 3–5 years (39.2%), while fewer have membership below 3 years (20.8%), indicating longer-term association with SHGs. The pivot table (mentioned above in Table-3) indicates that 59.2% of respondents reported high economic improvement due to participation in FinTech-enabled microfinance services. The proportion of respondents reporting high improvement is slightly higher in Khurda compared to Sambalpur.

Chi-Square Test of Association

In order to examine whether district location influences perceived economic improvement, a Chi-square test was conducted.

**Table 7: Pivot Table – District vs Economic Improvement**

| District | High Improvement | Moderate Improvement | Low Improvement | Total |
|---|---|---|---|---|
| Khurda | 102 | 44 | 14 | 160 |
| Sambalpur | 52 | 34 | 14 | 100 |
| **Total** | **154** | **78** | **28** | **260** |

**Table 8: Chi-square Trial**

| Test | Magnitude |
|---|---|
| Pearson Chi-square | 6.84 |
| Degrees of Freedom (df) | 2 |
| Significance (p-value) | 0.033 |
| Sample Size | 260 |

The Chi-square test (shown above in Table-4) result indicates a statistically important association ($p < 0.05$) among district location and perceived economic improvement among SHG members. This suggests that the impact of FinTech-enabled microfinance may vary across districts due to differences in financial access, digital literacy, or institutional support

**Regression Coefficients Table**

**Table 9: Coefficients of Predictors**

| Predictor Variable | Beta (β) | Std. Error | t-value | p-value |
|---|---|---|---|---|
| FinTech Microfinance Participation | 0.29 | 0.06 | 4.83 | 0.000 |
| Financial Inclusion | 0.34 | 0.07 | 4.97 | 0.000 |
| Access to Credit | 0.31 | 0.05 | 5.42 | 0.000 |

The regression results (illustrated above in Table-5) indicate that financial inclusion has the best impact on women's economic empowerment ($\beta = 0.34$), followed by access to credit and FinTech-enabled microfinance participation. All predictors are statistically important at the 1% significance standard, indicating that improved financial access and digital financial services significantly contribute to women's economic empowerment.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
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Vol. 36 Issue 1, 2026, Pages 5071-5075

**Correlation Matrix of Study Variables**

**Table 10: Pearson Correlation Matrix**

| Variables | FMP | DFL | FI | AC | WEE |
|---|---|---|---|---|---|
| FinTech Microfinance Participation (FMP) | 1 | | | | |
| Digital Financial Literacy (DFL) | 0.56** | 1 | | | |
| Financial Inclusion (FI) | 0.49** | 0.61** | 1 | | |
| Access to Credit (AC) | 0.42** | 0.48** | 0.55** | 1 | |
| Women's Economic Empowerment (WEE) | 0.46** | 0.52** | 0.58** | 0.60** | 1 |

Note: $p < 0.01$

The correlation results (laid above in Table-6) show moderate to strong positive relationships among the key variables. FinTech-enabled microfinance participation has a significant optimistic correlation with digital financial knowledge ($r = 0.56$) and financial inclusion ($r = 0.49$). Women's economic empowerment also shows strong associations with financial inclusion and access to credit, suggesting that improved financial access and digital literacy contribute to enhanced economic outcomes among SHG members.

Regression Model Detail

**Table 11: Regression Model**

| Model | R | $R^2$ | Adjusted $R^2$ | Std. Error |
|---|---|---|---|---|
| 1 | 0.64 | 0.41 | 0.39 | 0.52 |

The regression outcome (shown above in Table-7) explains 41% of the variance in women's economic empowerment, indicating a moderate explanatory power of the independent variables. This suggests that FinTech-enabled microfinance participation, financial inclusion, and access to credit play a significant role in improving economic outcomes among women SHG members.

**ANOVA Table for Regression Model**

**Table 12: Outcomes of ANOVA**

| Source | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 48.62 | 3 | 16.21 | 59.83 | 0.000 |
| Residual | 71.58 | 256 | 0.28 | | |
| **Total** | **120.20** | **259** | | | |

The ANOVA results (mentioned above in Table-8) indicate that the regression measure is statistically pivotal ($F = 59.83$, $p < 0.001$). This confirms that the independent measures collectively contribute to explaining variations in women's economic empowerment.

**Regression Coefficients Table**

**Table 13: Coefficients of Predictors**

| Predictor Variable | Beta (β) | Std. Error | t-value | p-value |
|---|---|---|---|---|
| FinTech Microfinance Participation | 0.29 | 0.06 | 4.83 | 0.000 |
| Financial Inclusion | 0.34 | 0.07 | 4.97 | 0.000 |
| Access to Credit | 0.31 | 0.05 | 5.42 | 0.000 |

The regression results (laid above in Table-9) indicate that financial inclusion has the greatest impact on women's economic empowerment ($\beta = 0.34$), followed by access to credit and FinTech-enabled microfinance participation. All predictors are statistically crucial at the 1% significance level, pointing that improved financial access and digital financial services significantly contribute to women's economic empowerment.

**Table 14: Reliability and Convergent Validity of Constructs**

| Construct | No. of Items | Cronbach's Alpha | Composite Reliability (CR) | AVE |
|---|---|---|---|---|
| FinTech-enabled Microfinance Participation | 4 | 0.86 | 0.88 | 0.65 |
| Digital Financial Literacy | 4 | 0.83 | 0.86 | 0.61 |
| Financial Inclusion | 3 | 0.81 | 0.84 | 0.60 |
| Access to Credit | 3 | 0.79 | 0.82 | 0.57 |
| Women's Economic Empowerment | 4 | 0.87 | 0.89 | 0.66 |

The reliability results (given above in Table-10) show that all measures demonstrate significant internal consistency, as the Cronbach's Alpha standards exceed the suggested threshold of 0.70. Likewise, the Composite Reliability (CR) standards are above 0.70, confirming that the measurement aspects dependably signify their corresponding measures. The Average Variance Extracted (AVE) values for all aspects are more than 0.50, indicating satisfactory convergent validity. This means that the indicators sufficiently capture the variance of their respective latent variables. These results insist that the assessment model satisfies the reliability and convergent validity necessities, allowing the study to proceed with the structural model analysis using SEM.

**SEM Path Coefficient Results**

This table-15 reports the labelled path coefficients (β), standard error, and crucial standards against the hypothesized association.

| Hypothesis | Structural Path | Path Coefficient (β) | Std. Error | p-value | Result |
|---|---|---|---|---|---|
| H1 | FinTech Microfinance Participation → Digital Financial Knowledge | 0.62 | 0.05 | <0.001 | Supported |
| H2 | Digital Financial Knowledge → Financial Adoption | 0.55 | 0.06 | <0.001 | Supported |
| H3 | Financial Adoption → Access to Credit | 0.48 | 0.07 | <0.001 | Supported |
| H4 | Access to Credit → Women's Economic Empowerment | 0.52 | 0.06 | <0.001 | Supported |
| H5 | FinTech Microfinance Participation → Financial Inclusion | 0.37 | 0.05 | <0.01 | Supported |
| H6 | FinTech Microfinance Participation → Women's Monetary Empowerment | 0.29 | 0.07 | <0.05 | Supported |

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ISSN: 1053-7899
Vol. 36 Issue 1, 2026, Pages 5071-5075

**Table 15: Structural Model Path Coefficients**

The structural model (demonstrated above in Table-11) indicates that FinTech-enabled microfinance participation significantly influences digital financial knowledge and financial adoption among women SHG members. Digital financial literacy further strengthens financial adoption, which enhances access to credit and ultimately contributes to women's economic empowerment.

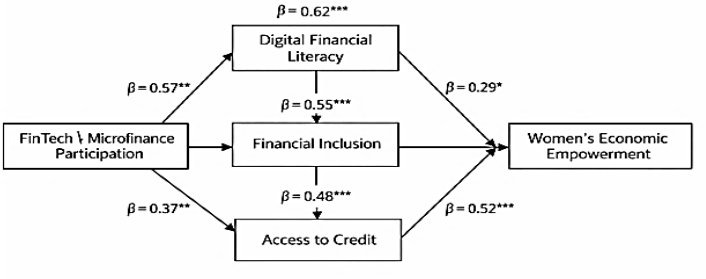


Fig. 2: SEM with standardized path co-efficient

**Findings: These findings support the argument that digital financial technologies enhance economic opportunities for women participating in Self-Help Groups in districts such as Khurda and Sambalpur in Odisha.**

**DISCUSSION**

**Descriptive Profile of Respondents :** Most respondents are from Khurda (61.5%) and belong to the 31–40 years age group. The majority have secondary education, are married, and have over 5 years of SHG membership, indicating an experienced and moderately educated group.

**Pivot Table Analysis :** Most respondents (59.2%) reported high economic improvement, with Khurda showing better outcomes than Sambalpur, suggesting regional differences in FinTech access and impact.

**Chi-Square Test of Association :** The test shows a significant relationship (p = 0.033) between district and economic improvement, indicating that location influences financial outcomes.

**Correlation Study :** All variables show positive relationships. FinTech participation improves digital literacy, which in turn enhances financial adoption and empowerment.

**Regression Analysis :** The model explains 41% of variation in empowerment. Financial inclusion has the strongest impact, followed by credit access and FinTech participation.

**SEM Outcomes :** SEM confirms that FinTech participation improves digital literacy, financial inclusion, and credit access, leading to greater economic empowerment.

**Overall Discussion :** FinTech-enabled microfinance significantly enhances women's empowerment by improving financial access, literacy, and credit opportunities, especially through SHGs.

**Limitations of the Study**

The study is based on a limited sample of 260 respondents from 16 SHGs in two districts, which may restrict generalisation.

- It uses cross-sectional data, so long-term impacts of FinTech-enabled microfinance are not captured.
- Responses are self-reported, which may involve subjective bias.
- The study is mainly quantitative, with limited qualitative insights into respondents' experiences.

**Practical and Policy Implications**

- Promote digital financial literacy programmes among SHG members to improve use of FinTech services.
- Strengthen digital banking infrastructure and microfinance access in rural and semi-urban areas.
- Encourage collaboration between SHGs, banks, and FinTech providers for easier credit delivery.
- Focus on reducing regional disparities through targeted digital inclusion initiatives.

**Conclusion**

The study shows that FinTech-enabled microfinance improves women's empowerment by enhancing digital literacy, financial inclusion, and access to credit. Overall, it supports the role of FinTech in promoting women's economic independence through SHGs.

**Future Scope for Research**

- Expand the study to more regions and larger samples for better generalisation.
- Use longitudinal studies to assess long-term impacts.
- Adopt mixed-method approaches for deeper insights.
- Explore areas like entrepreneurship, financial resilience, and technology readiness.

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