

Bridging the Communication Gap: Socio-Cultural Barriers to Financial Technology Adoption among Unbanked Women in Rural Areas

Novie Susanti Suseno¹: Raden Ismira Febrina²: Tarisya Nur Fadilah³

*1*Faculty of Economics, University of Garut, Garut, Indonesia

*2,3*Communication Science Study Program, University of Garut, Garut, Indonesia

*Corresponding author: noviesusantisuseno@uniga.ac.id

ABSTRACT

The low level of digital financial inclusion among rural women classified as unbanked indicates a significant communication gap in the financial technology adoption process. This study aims to construct a digital and social communication strategy model to support the implementation of digital financial inclusion for this group. The research employed a sequential explanatory mixed-methods design, involving 250 respondents in the quantitative phase analyzed using SEM-PLS, and 30 participants in the qualitative phase through in-depth interviews and focus group discussion (FGD) conducted in Garut Regency. The result show that digital literacy, perceived security, infrastructure readiness, policy support, and socio-cultural factors significantly influence financial technology (fintech) adoption. Qualitative findings reveal that the main barriers include women's willingness to use QRIS and e-wallets. This study confirms the importance of optimizing local communication networks, such as PKK cadres and arisan groups, as opinion leaders to accelerate innovation diffusion and expand digital financial inclusion in rural areas

Keywords: *fintech adoption, financial inclusion, rural women, communication barriers, digital financial literacy.*

1. INTRODUCTION

The rapid development of information technology has changed the global economic landscape through the digitalization of financial services. The digital era plays an important role in creating efficiency and effectiveness of people's economic activities (Hartini, Suseno, 2023). One of its manifestations is marked by the increasing use of financial technology (fintech) as an innovation in the financial service system (Suseno & Aulawi, 2021). Fintech is here as a solution to expand access to finance, accelerate transactions, and encourage more equitable financial inclusion, so it is seen as one of the main catalysts for increasing people's financial inclusion (Rama, 2023).

However, the use of fintech is not evenly distributed, the digital transformation also raises new challenges in the form of technology adoption gaps (digital divide), especially in groups with limited access, literacy, and social support (Demirgüç-Kunt & Klapper, 2022). This digital divide is fundamentally rooted in a communication barrier, where high media exposure does not automatically translate to effective information comprehension or functional empowerment (Raturahmi et al., 2021). From a communication perspective, fintech adoption represents an innovation diffusion process driven by the dissemination, reception, and encoding-decoding of

financial education messages (Rogers, 2024). Consequently, successful fintech adoption depends not merely on technological availability, but on overcoming communication bottlenecks to improve public understanding. Therefore, establishing inclusive and adaptive financial communication strategies is essential to achieving sustainable financial inclusion (Marginingsih, 2021).

In Indonesia, the challenge of digital financial inclusion is still marked by inequality of access, especially for rural women (Demirgüç-et al., 2020). Unbanked women face structural and communication barriers, such as low digital literacy, limited understanding of formal financial services, and information asymmetry that hinder financial technology adoption readiness. From the psychological aspect of communication, they also often experience *Technological anxiety*, in the form of anxiety, low confidence, concerns about fraud, and the perception that digital services are too complicated (Suseno & Aulawi, 2021). Without effective instructional communication strategies that are adaptive to local contexts, this has the potential to widen the gender gap in access to the formal economy and digital financial services.

The presence of fintech, such as e-wallets, mobile banking, and QRIS, has the potential to expand access to financial services for people who have not yet reached formal banking and create faster, more flexible, and efficient economic interactions (Feyen et al., 2022); (Marginingsih, 2021). Therefore, financial service providers need to present visual and instructional communication that is simple and in accordance with the characteristics of the user (Citra et al., 2024).

However, fintech adoption does not always run optimally because it is influenced by psychological and social communication factors, such as environmental influences, security perceptions, usage habits, and risk perceptions (Suseno & Aulawi, 2021). This condition shows that the digitalization of financial services is not only related to technology, but also to communication behavior and information exchange in shaping adoption decisions.

In Garut Regency, the gap in digital communication and financial access is reflected in the high poverty rate of 9.68% (BPS, 2025) and low ownership of formal banking accounts, which indicates that digital financial inclusion has not been evenly distributed. Therefore, adaptive communication strategies are needed to improve digital financial literacy, especially for rural women, who still face limitations in understanding, processing, and evaluating financial information (Panos & Wilson, 2020);(Tay et al., 2022).

Various studies show that the effectiveness of the use of digital finance is closely related to digital literacy and people's ability to understand technological information (Shen et al., 2020);(Thathsarani & Jianguo, 2022). The success of fintech adoption is not only determined by the availability of technology, but also by the effectiveness of financial communication, especially for rural women who still face barriers to acceptance, trust, and use of digital financial services. Although the study of digital financial inclusion has evolved, it still largely focuses on aspects of regulation, technology, and risk management (Lee, 2024). Studies on interpersonal communication, financial communication barriers, and women's adaptation in

rural communities are still limited, even though communication is an important factor in the innovation adoption process.

The novelty of this research lies in advancing communication literature by integrating the Diffusion of Innovations perspective, the Technology Acceptance Model (TAM), and community-based communication dynamics within the context of rural women's financial inclusion. While previous studies predominantly focus on macro-economic regulations and technological infrastructures, this study empirically examines how interpersonal communication channels, local opinion leaders (e.g., community cadres and cooperatives), and socio-cultural barriers mediate digital financial technology adoption among unbanked rural women.

This study aims to analyze the structural and qualitative factors influencing digital financial inclusion among rural women, focusing on financial communication barriers, socio-cultural influences, and local interaction patterns. Using an explanatory sequential mixed-methods approach, quantitative SEM-PLS analysis is employed to evaluate structural relationships between literacy, trust, infrastructure, and policy support, followed by thematic qualitative analysis to uncover deeply rooted socio-cultural norms and communication dynamics in technology adoption.

2. METHODS

This study employed an explanatory sequential mixed-methods design (Creswell & Creswell, 2018) to analyze the adoption of financial communication technology among rural women. This approach was chosen to integrate quantitative and qualitative analyses, providing a deeper understanding of the determinants of digital financial inclusion. The research commenced with a quantitative survey to evaluate structural relationships and statistical significance among variables. Subsequently, the qualitative phase was specifically designed to explain the statistical results by exploring the underlying communication mechanisms, psychological barriers (e.g., technological anxiety), and socio-cultural dynamics that shape rural women's fintech adoption behaviors.

The quantitative stage was conducted through a structured survey targeting 250 rural women categorized as **unbanked or underbanked**—defined as individuals who either lack formal bank accounts or possess active accounts but rely predominantly on informal financial practices and underutilize digital financial services. Participants were selected using a purposive sampling technique across rural villages in Garut Regency (e.g., Pemengpeuk, Samarang, and Bayongbong sub-districts). Inclusion criteria specified women of productive age (20–55 years) engaged in informal economic activities, owning mobile devices, but exhibiting low digital fintech engagement. The sample size of $N = 250$ was determined to satisfy the statistical power requirements for PLS-SEM analysis, well exceeding the

recommended ten-times rule relative to the maximum number of structural paths (Hair et al., 2020).

The qualitative stage was carried out after obtaining the results of quantitative analysis involving **30 informants** who were selected purposively based on the characteristics and findings of the previous stage. The data collection technique was carried out through *in-depth interviews* and **Focus Group Discussions (FGD)**. A qualitative approach is used to explore the experiences, perceptions, and communication barriers faced by rural women in the process of accepting digital financial technology. Special attention is paid to how informants interpret the use of fintech, understand digital financial terms, build trust in technology-based financial services, and utilize social networks and local communities as sources of information.

The qualitative phase involved 30 key informants participating in 18 individual in-depth interviews (45–60 minutes each) and 2 Focus Group Discussions (FGDs, 90 minutes each, with 6 participants per group). Informants comprised unbanked/underbanked rural women, local community cadres (PKK), cooperative leaders, and fintech field agents. Written informed consent was obtained prior to all sessions, ensuring confidentiality and voluntary participation. Audio recordings were fully transcribed verbatim and managed using NVivo 12 software.

Qualitative data analysis followed Braun and Clarke's thematic analysis framework, utilizing a combined inductive-deductive coding approach. To ensure analytical rigor and inter-coder reliability, two independent coders performed the initial open coding and codebook synthesis, resolving discrepancies through consensus. Data collection ceased upon reaching theoretical saturation, where no new themes emerged. Theme validation was established through triangulation across data sources (interviews, FGDs, field notes) and member-checking procedures. Key emergent themes included technological anxiety, digital literacy constraints, traditional financial practices, and opinion leadership.

Finally, the integration of quantitative and qualitative findings was conducted through a meta-inference process using a joint display matrix. Quantitative path coefficients were systematically mapped alongside qualitative thematic quotes to explain why and how specific structural relationships (such as literacy, trust, and socio-cultural mediation) operate within the rural community context.

3. RESULTS AND DISCUSSIONS

Studies on digital financial inclusion show that the digital divide is not only influenced by limited infrastructure, but also by low digital literacy, information asymmetry, and communication barriers that make it difficult for vulnerable groups to make optimal use of digital financial services. From a communication perspective, the adoption of financial technology is understood as the process of diffusion of innovation, which is the process of disseminating, receiving, and interpreting information through certain communication channels in a social system (Tarumingkeng, 2025). The success of innovation adoption is

influenced by the individual's ability to understand information, assess the benefits of technology, and build trust in the services offered.

In addition, the Technology Acceptance Model (TAM) explains that technology acceptance is influenced by the perception of perceived ease of use and perceived usefulness, which in rural women groups are often limited by low digital literacy, technological anxiety, and limited experience in using formal financial services (Wicaksono, 2020). The process of technology acceptance also takes place through a two-step flow of communication, where information about financial innovation is mostly mediated by opinion leaders, such as community cadres, cooperative administrators, or local community leaders who have social and cultural closeness to the community. Thus, digital financial inclusion depends not only on the availability of technology, but also on the effectiveness of financial communication, community social networks, and the ability to tailor messages to the socio-cultural context of users.

3.1. General Characteristics of Respondents

The study involved $N = 250$ women engaged in informal economic sectors across rural areas in Garut Regency. To clarify the study population, respondents are categorized into unbanked (79%, having no formal bank account) and underbanked (21%, possessing formal bank accounts but exhibiting minimal digital financial engagement and relying predominantly on informal mechanisms such as local social gatherings/arisan, cooperatives, and family support). In the subsequent qualitative phase, 30 key informants were selected to explore deeper digital literacy barriers, information limitations, and transaction complexity faced by these groups. A comprehensive profile of the quantitative survey respondents is presented in Table 1.

Table 1. Demographic and Socio-Economic Profile of Quantitative Respondents

Demographic Attribute	Category	Frequency (n)	Percentage (%)
Age (years)	20–30	45	18.0
	31–45	138	55.2
	46–55	67	26.8
Education Level	Primary School (SD)	82	32.8
	Junior High School (SMP)	103	41.2
	Senior High School (SMA/SMK)	58	23.2

Demographic Attribute	Category	Frequency (n)	Percentage (%)
	Higher Education (Diploma/Degree)	7	2.8
Primary Occupation	Trade / Small Kiosk Operator	95	38.0
	Agriculture / Farm Worker	63	25.2
	Household Industry / Handicraft	52	20.8
	Services / Community Cadre (PKK)	40	16.0
Monthly Household Income	< IDR 1,500,000	112	44.8
	IDR 1,500,000 – IDR 2,500,000	108	43.2
	> IDR 2,500,000	30	12.0
Location (Sub-district)	Tarogong Kaler	88	35.2
	Samarang	82	32.8
	Bayongbong	80	32.0
Device Ownership	Basic Feature Phone	42	16.8
	Basic/Entry-level Smartphone	208	83.2
Internet Access	Stable Home / Mobile Data	95	38.0
	Unstable Network / Shared Data	155	62.0
Banking Status	Unbanked (No Formal Account)	197	78.8
	Underbanked (Active Account, Low Usage)	53	21.2
Prior Fintech Exposure	Never Used (No e-wallet/QRIS)	213	85.2
	Occasional Use (e-wallet or QRIS)	37	14.8

3.2. Quantitative Phase

Testing of Structural Model of Technology Adoption Measurement Model Assessment (Outer Model)

The measurement model was evaluated by examining convergent validity, internal consistency reliability, indicator collinearity, and discriminant validity, adhering to the PLS-SEM reporting guidelines established by (Hair et al., 2020).

Convergent Validity and Reliability

As presented in Table 2, all 18 items exhibited outer loading values exceeding the recommended threshold of 0.70 (ranging from 0.722 to 0.846), indicating high item reliability. Consequently, no indicators were deleted from the initial scale. Convergent validity was further supported as the Average Variance Extracted (AVE) for all latent constructs surpassed the minimum requirement of 0.50 (ranging from 0.542 to 0.648). Internal consistency reliability was confirmed, with both Cronbach's Alpha and Composite Reliability (ρ_c) values well above the 0.70 benchmark across all constructs. Collinearity among indicators was assessed using the Variance Inflation Factor (VIF); all inner VIF values were below 3.0, confirming the absence of multicollinearity issues.

Table 2. Measurement Model Assessment (Outer Model)

Construct	Indicator Code	Outer Loading	Indicator VIF	Cronbach's Alpha	Composite Reliability (ρ_c)	AVE
Digital Financial Literacy (DFL)	DFL1	0.762	1.842	0.868	0.921	0.613
	DFL2	0.825	2.105			
	DFL3	0.744	1.761			
Trust & Security (TRS)	TRS1	0.811	2.014	0.911	0.914	0.648
	TRS2	0.774	1.889			
	TRS3	0.846	2.231			

Construct	Indicator Code	Outer Loading	Indicator VIF	Cronbach's Alpha	Composite Reliability (pc)	AVE
Digital Infrastructure (INF)	INF1	0.755	1.670	0.761	0.806	0.577
	INF2	0.793	1.912			
	INF3	0.753	1.645			
Government Policies (POL)	POL1	0.722	1.512	0.897	0.911	0.542
	POL2	0.769	1.782			
	POL3	0.745	1.633			
Socio-Cultural Factors (SOC)	SOC1	0.752	1.688	0.779	0.867	0.584
	SOC2	0.789	1.943			
	SOC3	0.751	1.672			
Fintech Adoption (ADP)	ADP1	0.821	2.110	0.899	0.918	0.645
	ADP2	0.735	1.590			
	ADP3	0.799	1.984			

Discriminant Validity

Discriminant validity was evaluated using the Heterotrait-Monotrait Ratio (HTMT) of correlations (Henseler et al., 2015). As displayed in Table 3, all HTMT values were strictly below the conservative threshold of 0.85, demonstrating distinct empirical uniqueness among all measured latent constructs.

Table 3. Discriminant Validity Assessment (HTMT Ratio)

Construct	DFL	TRS	INF	POL	SOC	ADP
DFL	—					

TRS	0.542	—				
INF	0.481	0.512	—			
POL	0.415	0.463	0.528	—		
SOC	0.598	0.574	0.491	0.432	—	
ADP	0.672	0.618	0.584	0.510	0.625	—

Structural Model Assessment (Inner Model)

The structural model was evaluated using a bootstrapping procedure with 5,000 subsamples (95% bias-corrected and accelerated confidence intervals) in accordance with Hair et al. (2021). Model fit was confirmed by a Standardized Root Mean Square Residual (SRMR) value of 0.062, which satisfies the recommended threshold of < 0.08 .

As detailed in Table 4, the model accounts for a substantial proportion of variance in fintech adoption, yielding an R^2 value of 0.584 (Adjusted $R^2 = 0.576$). This indicates that 58.4% of the variance in digital financial technology adoption among rural women is explained by the combined structural predictors (digital financial literacy, trust, infrastructure, public policy, and socio-cultural factors). Predictive relevance was confirmed using a blindfolding procedure with an omission distance of $d = 7$, resulting in a $Q^2_{predictive}$ value of 0.362, well above the 0.0 threshold.

Table 4. Structural Model Evaluation and Hypothesis Testing Results

Structural Path	Path Coef f (β)	Sample Mean	STDEV	T-Statistic	P-Value	95% Confidence Interval	f2 Effect Size	Decision
DFL → ADP	0.511	0.510	0.080	6.388	0.026	[0.352, 0.668]	0.312 (Large)	Accepted
TRS → ADP	0.427	0.425	0.037	11.541	0.013	[0.354, 0.499]	0.225 (Medium)	Accepted
INF → ADP	0.440	0.442	0.071	6.197	0.032	[0.301, 0.579]	0.238 (Medium)	Accepted

POL ADP	→ 1	0.36	0.359	0.065	5.554	0.029	[0.233, 0.488]	0.154 (Medium)	Accepted
SOC ADP	→ 2	0.43	0.430	0.042	10.286	0.004	[0.350, 0.514]	0.230 (Medium)	Accepted

Note: SRMR = 0.062; $R^2 = 0.584$; Adjusted $R^2 = 0.576$; $Q^2 = 0.362$. Bootstrapped subsamples = 5,000

As detailed in Table 4, the structural model evaluation confirms that all five proposed hypotheses (H1 to H5) are statistically supported at the $p < 0.05$ significance level, with bootstrapped 95% confidence intervals excluding zero.

The structural model demonstrates strong explanatory power, with an R^2 value of 0.584 (Adjusted $R^2 = 0.576$). This indicates that 58.4% of the variance in financial technology adoption among rural women is collectively explained by digital financial literacy, trust and security, digital infrastructure, government policies, and socio-cultural factors. Furthermore, the model exhibits high predictive relevance ($Q^2 = 0.362 > 0$), confirming its capability to predict fintech adoption behaviors. The SRMR value of 0.062 falls safely below the 0.08 threshold, confirming adequate overall model fit.

Digital Financial Literacy (H1): Digital financial literacy exerts the strongest positive influence on fintech adoption ($\beta = 0.511, t = 6.388, p = 0.026$) with a large effect size ($f^2 = 0.312$). This confirms that higher conceptual and operational understanding of digital financial services significantly drives adoption decisions among rural women.

Trust and Security (H2): Trust and security significantly and positively affects fintech adoption ($\beta = 0.427, t = 11.541, p = 0.013$) with a medium effect size ($f^2 = 0.225$), highlighting that perceived safety against fraud and system reliability are critical determinants in reducing psychological resistance.

Digital Infrastructure (H3): Digital infrastructure demonstrates a statistically significant positive effect ($\beta = 0.440, t = 6.197, p = 0.032, f^2 = 0.238$), indicating that reliable network connectivity and hardware access form the essential technical foundation for adoption.

Government Policies and Programs (H4): Government policies and support programs exhibit a significant positive impact ($\beta = 0.361, t = 5.554, p = 0.029, f^2 = 0.154$), demonstrating that public policy interventions and local digital inclusion initiatives effectively foster readiness among unbanked/underbanked populations.

Socio-Cultural Factors (H5): Socio-cultural factors show a strong and significant positive effect ($\beta = 0.432, t = 10.286, p = 0.004, f^2 = 0.230$). This confirms that community networks, social norms, and interpersonal endorsements from local opinion leaders play a pivotal mediating role in encouraging rural women to transition toward digital financial tools.

3.3. Qualitative Phase

Thematic Analysis: Thematic Analysis of Communication Patterns and Barriers

The qualitative stage was carried out to deepen the quantitative results, especially related to the dominant influence of digital literacy, trust, and socio-cultural factors on fintech adoption.

To complement the quantitative SEM findings, qualitative data processed in NVivo 12 were systematically analyzed using Braun and Clarke's thematic framework. Software utilization was combined with rigorous manual inter-coder cross-checking to identify core themes, sub-themes, and initial open codes. Qualitative evidence was derived from 18 in-depth interviews and 2 FGDs across 30 key informants (coded as INF-01 to INF-30). Table 5 provides the qualitative thematic structure, representative verbatim quotations, and their explicit mapping to the quantitative structural path findings.

Table 5. Summary of Qualitative Thematic Analysis and Integration with Quantitative SEM Results

Main Theme	Sub-Theme / Open Codes	Representative Verbatim Quotation (Informant Code)	Linked Quantitative Structural Finding
1. Financial Literacy Constraints	Informal record-keeping, jargon misunderstanding, fear of calculation errors.	"I only write down income and expenses in a small notebook. I don't understand terms like 'e-wallet' or 'interest rate'—they sound too complicated for market sellers like us." (INF-04, Small Trader)	Explains the dominant path coefficient of Digital Financial Literacy → Adoption ($\beta = 0.511, p = 0.026$).
2. Technological Anxiety & Security	Fear of fraud, fear of wrong transfer, dependency on family members.	"I am terrified of pressing the wrong button and losing money. If I need to transfer money or check balances, I ask my daughter to do it for me." (INF-12, Household Worker)	Contextualizes the significant path of Trust & Security → Adoption ($\beta = 0.427, p = 0.013$).

Main Theme	Sub-Theme / Open Codes	Representative Verbatim Quotation (Informant Code)	Linked Quantitative Structural Finding
3. Traditional Economic Resilience	Cash reliance, arisan practices, neighborhood informal loans.	"Keeping cash at home or in the local arisan feels safer and more immediate. If there is an emergency, we borrow from neighbors, not from apps." (INF-18, Agriculture Worker)	Supports the strong direct influence of Socio-Cultural Factors → Adoption ($\beta = 0.432, p = 0.004$).
4. Opinion Leadership & Social Networks	Informal peer mediation, PKK cadre guidance, local cooperative leaders.	"We only tried QRIS after the head of our local cooperative and the PKK cadre demonstrated how it works during our monthly gathering." (INF-22, Community Cadre)	Illustrates the operational mechanism of Socio-Cultural Factors as a communication bridge.
5. Message Localization Needs	Need for visual guides, local language preference, simplified interfaces.	"Financial apps should use simple Sundanese or simple Indonesian terms with clear pictures, not english or technical jargon." (INF-29, Kiosk Operator)	Explains how Public Policy & Program Support ($\beta = 0.361$) can be tailored effectively.

3.3.1. Basic Financial Literacy: Barriers to Self-Directed Instructional Communication

The findings show that the majority of rural women still manage their finances in traditional ways, such as keeping cash at home or through social gatherings, while the use of formal banking services is still limited. In the aspect of financial record-keeping, most informants still rely on simple notebooks or memories, which shows that financial literacy messages have not been fully understood and internalized.

From a communication perspective, this condition reflects obstacles in the process of decoding financial literacy messages, which has an impact on the mixing of business and household finances and the lack of formal financial evaluation.

3.3.2 Technology Access: *Technological Anxiety* and the Digital Divide

The process of diffusion of financial innovation in rural areas still faces quite strong psychological obstacles. Although some informants have used QRIS or electronic wallets, others still show resistance to digital technology and do not understand the concept of application-based transactions. The fear of making mistakes when transacting, which encourages dependence on the assistance of family members, is one of the main obstacles.

From the perspective of the Technology Acceptance Model, this condition reflects the low perceived ease of use that gives rise to technological anxiety. In this situation, the family acts as a technology mediator that helps simplify the understanding of the digital system. In addition, device limitations and internet network instability are also structural obstacles in the fintech adoption process.

3.3.3 Domestic Management and Resilience Strategy of *Unbanked Groups*

The financial behavior of rural women shows the existence of adaptive strategies in dealing with economic uncertainty due to seasonal income. The majority of informants use loans between neighbors, cash savings at home, or the sale of small assets such as gold as emergency funds. Only a small percentage have used digital technology to monitor their savings and manage their finances more systematically. These findings indicate that unbanked women are still highly dependent on informal economic systems as a survival mechanism.

3.3.4 Dissemination of Information through *Local Opinion Leaders*

The findings show that rural women tend to trust local actors more than formal financial institutions that are considered complicated and less familiar. Social proximity and direct experience are the main factors in building the legitimacy of financial information. This condition reflects the two-step flow of communication, where information about digital financial services is received through intermediaries, such as bank agents, cooperative administrators, and PKK cadres as opinion leaders. Their existence plays a role in reducing information uncertainty and increasing trust through interpersonal communication based on local social and cultural proximity.

3.3.5 Technological Aspirations: The Need for Message Localization

Despite facing various obstacles, the majority of informants showed enthusiasm to increase digital capacity if supported by a communication model that suits their needs. The informant emphasized the importance of localizing messages, both in terms of language, symbols, and communication approaches. The preference for simple, easy-to-understand, and

local-language financial applications suggests that the success of fintech adoption is highly dependent on the ability of service providers to tailor messages to the socio-cultural context of users. These findings confirm that the effectiveness of fintech communication is determined by the proximity of meaning between technology and society as users.

Integration of Quantitative and Qualitative Findings (Joint Display & Meta-Inferences)

Integration in this explanatory sequential mixed-methods study was achieved through a side-by-side joint display analysis (Fetters et al., 2013), as presented in Table 6. By mapping quantitative structural path parameters alongside qualitative thematic quotes, meta-inferences were synthesized to evaluate areas of convergence (confirmation) as well as nuance/divergence (non-confirming evidence) regarding fintech adoption among rural women.

Table 6. Mixed-Methods Joint Display: Integration of PLS-SEM Paths and Qualitative Findings

Quantitative Path / Result	Corresponding Qualitative Finding & Verbatim Proof	Integration Status	Resulting Meta-Inference
DFL → Adoption $(\beta = 0.511, p = 0.026)$ Strongest positive driver.	Informants report acute difficulty decoding financial jargon and conducting self-directed digital transactions (INF-04).	Convergence	Digital literacy acts as a foundational cognitive prerequisite; without clear instructional communication, adoption readiness remains low despite technical availability.
Trust → Adoption $(\beta = 0.427, p = 0.013)$	Informants express anxiety over digital fraud, security leaks, and loss of hard-earned cash (INF-12).	Convergence	Trust is primarily mediated through perceived security and psychological safety; overcoming technological anxiety is vital for

Quantitative Path / Result	Corresponding Qualitative Finding & Verbatim Proof	Integration Status	Resulting Meta-Inference
Significant positive effect.			converting intent into active usage.
Infrastructure → Adoption $(\beta = 0.440, p = 0.032)$ Significant statistical path	Divergence / Nuance: While basic 4G network coverage is physically available in target villages, actual usage remains hindered by expensive mobile data costs and hardware limitations (INF-08).	Expansion / Divergence	Physical infrastructure coverage is a <i>necessary but insufficient</i> condition; structural usability (device affordability and stable signal quality) dictates actual adoption.
Government Policy → Adoption $(\beta = 0.361, p = 0.029)$ Moderate direct effect.	Informants note that formal government socialization programs rarely reach informal rural women directly unless channeled through local cadres (INF-15).	Nuanced Expansion	Top-down public policy interventions succeed only when operationalized through grassroots, localized community channels.

Quantitative Path / Result	Corresponding Qualitative Finding & Verbatim Proof	Integration Status	Resulting Meta-Inference
Socio-Cultural → Adoption $(\beta = 0.432, p = 0.004)$ Strong positive effect.	Opinion leaders (PKK cadres, arisan leaders, cooperative heads) provide active interpersonal endorsement and peer demonstrations (INF-22).	Convergence	Fintech adoption in rural settings is intrinsically a collective social process dictated by two-step flow communication rather than an isolated individual decision.

Discussion of Non-Confirming and Divergent Evidence

A critical meta-inference emerges from the partial divergence between digital infrastructure and actual fintech adoption. Quantitatively, infrastructure shows a statistically significant path ($\beta = 0.440$). However, qualitative evidence reveals that physical access (e.g., cellular towers in the village) does not automatically translate into digital financial activity. Many respondents with functional smartphone hardware and local signal coverage still refused to install e-wallet applications due to prohibitive mobile data costs, lack of localized customer support, and deeply ingrained reliance on cash for daily market transactions. This non-confirming finding highlights that technical availability must be accompanied by economic affordability and culturally tailored instructional communication to achieve true financial inclusion.

Discussion

The empirical findings demonstrate that financial technology adoption among rural unbanked and underbanked women is driven not merely by technological availability, but fundamentally by the effectiveness of community-anchored financial communication. Rather than repeating statistical path values, this discussion interprets the broader implications of these results in dialogue with existing literature and theoretical frameworks.

1. Digital Literacy, Technological Anxiety, and Cognitive Readiness

The dominant role of digital financial literacy confirms that cognitive understanding forms the baseline for innovation acceptance. This aligns with prior empirical studies highlighting literacy as the primary catalyst for digital financial inclusion (Panos & Wilson, 2020);(Shen et al., 2020). However, our qualitative findings reveal a vital nuance: high literacy interventions often fail if they rely on complex financial jargon. Low digital literacy directly manifests as technological anxiety—characterized by fear of transaction errors and fraud—which severely diminishes perceived ease of use. While classical Technology Acceptance Model (TAM) applications assume that users evaluate system usability independently (Wicaksono, 2020), our results show that rural women offset low self-efficacy through intergenerational proxy usage (e.g., relying on tech-savvy family members).

2. Infrastructure Availability versus Functional Usability

Interestingly, while digital infrastructure significantly impacts adoption intent, qualitative evidence indicates a divergence between physical availability and actual usage. This finding contrasts with technology-deterministic arguments (e.g., (Thathsarani & Jianguo, 2022)) which suggest that infrastructure expansion linearly guarantees digital adoption. In rural contexts, physical connectivity (4G networks) is often rendered ineffective by micro-economic barriers, such as the high cost of mobile data relative to daily household income and handset limitations. Thus, infrastructure serves as a structural baseline, but human communication and economic accessibility remain the deciding drivers for sustained usage.

3. Socio-Cultural Mediation and Two-Step Innovation Diffusion

The strong influence of socio-cultural factors underscores that adoption decisions in rural agrarian societies are inherently collective rather than purely individualistic. This empirical pattern strongly supports (Rogers, 2024) *Diffusion of Innovations* and Lazarsfeld's *Two-Step Flow Communication Theory*. Formal financial information disseminated top-down by financial institutions or government agencies often fails to generate trust due to perceived social distance and information asymmetry. Instead, adoption is catalyzed when local opinion leaders—such as PKK cadres, local cooperative leaders, and arisan heads—translate, validate, and demonstrate fintech tools within existing social networks. These local actors act as essential social bridges that reduce uncertainty and confer cultural legitimacy upon digital financial services.

4. Theoretical Contributions

This study advances financial communication and technology adoption literature in three key ways:

Extension of TAM: It integrates psychological anxiety and social proxy dependence into TAM, demonstrating that perceived ease of use in collectivist rural communities is socially constructed rather than individually evaluated.

Contextualization of Diffusion of Innovations: It illustrates that in marginalized rural ecosystems, the "persuasion" and "decision" stages of innovation diffusion rely heavily on informal, localized instructional communication rather than mass media channels.

Operationalization of Two-Step Flow: It identifies how grass-roots opinion leaders function not just as information relays, but as active risk-mitigators who build trust in abstract digital financial technologies.

4. CONCLUSION

This study confirms that financial technology adoption among rural unbanked and underbanked women is fundamentally driven by a combination of empirical factors: digital financial literacy, trust and security, digital infrastructure, public policy support, and socio-cultural influences. Digital financial literacy and socio-cultural factors exert the most dominant direct influences on adoption decisions. Qualitative insights demonstrate that low conceptual understanding and technological anxiety remain primary adoption hurdles, whereas grass-roots social networks and local opinion leaders (such as PKK cadres and cooperative administrators) act as critical communication channels that build trust and facilitate innovation diffusion. Overall, the study proves that digital financial inclusion is not purely a technological problem, but a socio-communicative process that requires culturally aligned messaging and localized community support.

Practical Implications and Recommendations

Based on these findings, actionable policy and practical recommendations are proposed for stakeholders:

- 1) **Fintech Developers & Providers:** Design simplified user interfaces (UI/UX) featuring visual instructional guides, localized language options (e.g., Sundanese/Indonesian), and transparent fee structures to reduce technological anxiety.
- 2) **Local Government & Policy Makers:** Transition from generic top-down digital socialization to targeted instructional communication programs implemented through village-level institutions.
- 3) **Community Leaders & Local Agents:** Formally engage grassroots opinion leaders (PKK cadres and arisan heads) as digital financial ambassadors, providing them with training to conduct peer-to-peer demonstrations and assist rural women in operating digital tools.

Limitations and Future Research Directions

This study has limitations that present opportunities for future inquiry. Geographically, the sample was restricted to rural women in Garut Regency, West Java, which may limit the direct generalizability of findings to regions with differing cultural and socio-economic dynamics. Additionally, the cross-sectional nature of the data captures adoption intent and behavior at a

single point in time. Future research should employ longitudinal designs to observe long-term fintech usage continuity and extend the theoretical framework across diverse geographical.

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