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Bridging the Digital Divide: Community-Based Digital Innovation for Inclusive Socioeconomic Development

Napat Chai[1], Aom Thai[2], Pong Krit[3], Ma'rifani Fitri Arisa[4]
[1]Mahidol University, Thailand
[2]Srinakharinwirot University, Thailand
[3]Rangsit University, Thailand
[4]Universitas Negeri Yogyakarta, Indonesia

ABSTRACT

Background. Despite digital growth, inequalities in literacy and institutional support prevent vulnerable communities from participating in the digital economy. Access to infrastructure alone is not enough to bridge this gap.
Purpose. This study examines how community-based digital innovation initiatives help bridge the digital divide and promote inclusive socioeconomic outcomes.
Method. A mixed-methods study involving 180 participants across three regions, using digital literacy assessments, socioeconomic surveys, interviews, and focus groups.
Results. Statistical analysis showed significant improvements ($p < 0.001$) in digital literacy, income, and employment. Digital literacy gains were found to be a key predictor of income growth.
Conclusion. Community-based innovation effectively turns digital access into economic empowerment. Success requires combining infrastructure investment with grassroots capacity-building.

KEYWORDS

Community-Based Innovation; Digital Empowerment; Digital Divide; Digital Literacy; Socioeconomic Inclusion.

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Correspondence:

Napat Chai,
Napatchai@gmail.com

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INTRODUCTION

Digital transformation has reshaped economic systems, social interaction, governance structures, and access to knowledge across the globe. Rapid technological advancement has generated unprecedented opportunities for innovation, entrepreneurship, and productivity growth (Ghimire, 2026). Access to digital infrastructure, digital literacy, and technological platforms increasingly determines participation in economic and civic life (Nohuddin dkk., 2025). Societies that effectively integrate digital technologies into community competitive strategies demonstrate enhanced competitiveness and social technologies into community development strategies demonstrate enhanced competitiveness and social mobility.

Persistent disparities in digital access and capability, however, continue to widen socioeconomic inequalities between and within nations (Odularu, 2025). The digital divide extends beyond physical connectivity to encompass disparities in skills, affordability, technological relevance, and institutional support (Xu dkk., 2026).

Marginalized communities, rural populations, women, and informal workers often experience limited digital participation, restricting their access to employment, education, healthcare, and financial services (Almekhlafi dkk., 2025). Digital exclusion therefore functions not merely as a technological issue but as a structural barrier to inclusive development.

Community-based digital innovation has emerged as a promising approach to address these inequities (Bandopadhyay dkk., 2025). Local initiatives grounded in participatory models and contextualized solutions offer pathways for empowering underserved populations (Coughlan dkk., 2025). Grassroots digital platforms, cooperative technology hubs, and locally adapted digital entrepreneurship programs illustrate how innovation can be anchored within community ecosystems (Torrisi-Steele, 2025). Sustainable socioeconomic development increasingly depends on integrating digital inclusion strategies with local capacity-building mechanisms.

Despite significant investments in national digital infrastructure, substantial segments of society remain excluded from meaningful digital participation (Kostas dkk., 2025). Connectivity alone has proven insufficient to guarantee socioeconomic advancement when digital skills, trust, and contextual relevance are lacking (Topali dkk., 2025). Communities with limited institutional support frequently struggle to translate technological access into economic opportunity (Katona & Gyonyoru, 2025). The persistence of this gap underscores the inadequacy of top-down digital development models.

Existing digital inclusion programs often prioritize hardware provision and connectivity metrics while overlooking social capital, local governance structures, and community engagement (Hadar Shoval, 2025). Short-term training initiatives may produce temporary skill acquisition without fostering sustainable digital ecosystems (Xiao dkk., 2025). Fragmented interventions fail to integrate economic empowerment, digital literacy, and innovation capacity into a coherent development strategy (Soussou & Hamrouni, 2025). Structural inequality therefore persists despite expanding technological infrastructure.

The central problem addressed in this study concerns the need to understand how community-based digital innovation can function as a catalyst for inclusive socioeconomic development (L. Gupta dkk., 2025). Limited empirical research examines the mechanisms through which grassroots digital initiatives translate into measurable economic and social outcomes (Mekheimer, 2025). The absence of integrated models connecting digital inclusion, local innovation ecosystems, and socioeconomic impact necessitates systematic investigation.

This study aims to analyze the role of community-based digital innovation in bridging the digital divide and promoting inclusive socioeconomic development (García dkk., 2025). The research seeks to identify key components of successful community-driven digital initiatives, including governance models, skill development strategies, and resource mobilization mechanisms (Karra & RamaRao, 2025). Emphasis is placed on understanding how localized innovation ecosystems generate sustainable economic benefits.

Another objective involves examining the relationship between digital literacy enhancement and economic participation within underserved communities (Puccia dkk., 2025). The study intends to evaluate whether participation in community-based digital programs correlates with improved employment opportunities, entrepreneurial activity, and income stability (Das, 2025). Measurement of both quantitative economic indicators and qualitative social empowerment outcomes strengthens analytical depth.

A further objective focuses on developing a conceptual framework that integrates digital inclusion with community empowerment theory (Peng dkk., 2025). The research aims to articulate a model that connects infrastructure access, digital competence, collaborative innovation, and socioeconomic resilience (Atobishi & Mansur, 2025). Empirical validation of this framework is expected to inform policy design and community development strategies.

Extant literature on the digital divide primarily concentrates on access disparities and infrastructure expansion (Nurulla Khoja, 2025). Studies frequently emphasize broadband penetration rates, device ownership, and connectivity metrics as indicators of progress (Chatzichristos dkk., 2025). Limited attention is given to community-level innovation dynamics

that enable sustained socioeconomic transformation (Thorndahl dkk., 2025). The gap lies in insufficient integration between digital access research and grassroots innovation studies.

Research on digital entrepreneurship and innovation ecosystems often focuses on urban technology clusters and high-growth startup environments (Boiteau dkk., 2025). Rural and marginalized communities remain underrepresented in empirical analyses (Lyu dkk., 2025). Existing models rarely account for social capital, local leadership, and participatory governance as mediating variables in digital adoption outcomes (Alharthi, 2025). A comprehensive understanding of community-based digital innovation as a development mechanism remains underdeveloped.

Theoretical fragmentation further characterizes the literature (Silva dkk., 2025). Digital inclusion research draws from information systems and public policy, while community development scholarship emphasizes empowerment and participatory governance (Kagona, 2025). Few studies synthesize these perspectives into a unified analytical framework (MacPherson dkk., 2025). Bridging these disciplinary divides is necessary to construct a holistic model of inclusive digital transformation.

The novelty of this research lies in its integrative framework that positions community-based digital innovation as a strategic bridge between technological access and socioeconomic empowerment (Cui dkk., 2025). The study advances beyond descriptive accounts of connectivity by examining structural mechanisms that transform digital participation into tangible economic outcomes. Emphasis on grassroots innovation ecosystems differentiates this work from macro-level digital development analyses.

Methodological innovation further strengthens the study's contribution. The proposed approach combines socioeconomic indicators, digital literacy assessment, and qualitative evaluation of community governance models. Multilevel analysis enables examination of both individual empowerment trajectories and collective economic impact. The integration of quantitative and qualitative dimensions enhances explanatory rigor and practical relevance.

The significance of this research extends to policymakers, development practitioners, and scholars of digital transformation. Effective strategies for inclusive socioeconomic development require evidence-based models that align technological investment with community capacity-building. Findings are expected to inform sustainable digital policy frameworks and promote equitable participation in the digital economy. Justification for this study rests on its potential to advance theoretical understanding while offering actionable pathways for reducing structural digital inequality.

RESEARCH METHODOLOGY

This study employed a mixed-methods research design integrating quantitative impact assessment with qualitative case study analysis to examine how community-based digital innovation contributes to inclusive socioeconomic development (A. Gupta dkk., 2025). A convergent parallel design was adopted to allow simultaneous collection and analysis of quantitative and qualitative data, enabling triangulation and comprehensive interpretation (Lugoma dkk., 2025). The quantitative component focused on measuring changes in digital literacy, employment status, income stability, and entrepreneurial activity among participants engaged in community-driven digital initiatives (Calanchez Urribarri & Chavez Vera, 2025). The qualitative component explored governance structures, participatory processes, and local innovation dynamics that shaped program implementation and sustainability.

A multi-site comparative framework was utilized to capture contextual variation across different communities. Selected cases represented rural and peri-urban areas with active community-based digital programs such as digital training hubs, cooperative innovation labs, and grassroots e-commerce initiatives. The research design emphasized both outcome evaluation and process tracing to identify mechanisms linking digital access to socioeconomic inclusion. Analytical

rigor was strengthened through integration of descriptive statistics, inferential analysis, and thematic coding procedures.

The theoretical framework combined digital inclusion theory, community empowerment models, and innovation ecosystem perspectives. This integrated approach guided data interpretation by examining structural, institutional, and social factors influencing digital adoption and economic participation. Ethical clearance was obtained prior to fieldwork, and all procedures complied with established standards of informed consent and confidentiality.

The population of this study consisted of individuals and community organizations participating in local digital innovation programs within selected underserved regions. Participants included community members enrolled in digital literacy training, local entrepreneurs utilizing digital platforms, program facilitators, and community leaders responsible for governance and resource coordination. The research sites were selected based on evidence of sustained community-based digital initiatives operating for at least two years.

A purposive sampling strategy was employed to ensure inclusion of participants directly engaged in digital innovation activities. The quantitative sample comprised 180 participants across three research sites, ensuring adequate statistical power for inferential analysis. Stratified sampling ensured representation of gender, age groups, and occupational categories to reflect demographic diversity. Baseline characteristics were documented to examine comparability across sites.

The qualitative sample included 24 key informants selected based on leadership roles, program experience, and involvement in decision-making processes. Focus group discussions were conducted with participant cohorts to capture collective perspectives on program impact and challenges. The sampling framework enabled both breadth in quantitative measurement and depth in contextual understanding.

Data collection instruments included structured questionnaires, digital literacy assessment tools, semi-structured interview guides, and observation protocols. The structured questionnaire measured socioeconomic indicators such as employment status, income changes, entrepreneurial engagement, and perceived economic resilience. A validated digital literacy scale assessed participants' competencies in information retrieval, online communication, digital transactions, and cybersecurity awareness. Reliability testing produced Cronbach's alpha coefficients above 0.85 for all scales, indicating high internal consistency.

Semi-structured interview guides were developed to explore governance models, community participation mechanisms, resource mobilization strategies, and barriers to digital inclusion. Focus group protocols facilitated discussion on collective innovation practices and social empowerment outcomes. Observational checklists were used to document training sessions, digital platform usage, and collaborative activities within innovation hubs.

Secondary data sources, including community program records and local economic statistics, were collected to complement primary data. Data management software was employed to ensure systematic coding, storage, and analysis. Instrument validity was established through pilot testing and expert review prior to full-scale implementation.

Data collection began with baseline surveys administered to participants prior to assessment of program impact. Quantitative questionnaires were distributed in person and electronically, depending on site accessibility. Digital literacy assessments were conducted through standardized tasks performed under supervised conditions. Socioeconomic indicators were recorded using self-reported data verified, when possible, through program documentation.

Qualitative data collection occurred concurrently through in-depth interviews and focus group discussions. Interviews were audio-recorded with participant consent and transcribed verbatim for

analysis. Field observations were conducted during digital training sessions and innovation meetings to capture real-time interaction patterns and contextual factors influencing program effectiveness.

Quantitative data were analyzed using descriptive statistics, paired-sample t-tests, and regression analysis to determine relationships between digital participation and socioeconomic outcomes. Qualitative data were subjected to thematic coding to identify recurring patterns and explanatory mechanisms. Integration of findings occurred during the interpretation phase, where quantitative trends were examined alongside qualitative insights to construct a comprehensive model of community-based digital innovation and inclusive development. Validation procedures included triangulation, member checking, and peer debriefing to enhance credibility and analytical reliability.

RESULT AND DISCUSSION

Quantitative analysis was conducted on data collected from 180 participants across three community-based digital innovation sites. Baseline data indicated that 62% of participants were either unemployed or engaged in informal low-income work prior to joining the program. After twelve months of participation, 41% reported improved employment status, including new formal employment (18%), expanded micro-enterprise activity (15%), and transition to digital platform-based income streams (8%). Average monthly income increased from USD 145 to USD 212, representing a 46% mean growth across the sample.

Table 1. Socioeconomic and Digital Literacy Outcomes Before and After Program Participation (N = 180)

Variable	Baseline Mean (SD)	Post-Intervention Mean (SD)
Digital Literacy Score (0–100)	48.7 (12.5)	76.3 (10.8)
Monthly Income (USD)	145 (52)	212 (61)
Employment Stability Index (0–5)	2.1 (0.9)	3.8 (1.0)
Entrepreneurial Activity (%)	23%	39%

Secondary community records confirm a 32% increase in locally registered digital micro-enterprises during the intervention period. Participation in digital financial services rose from 28% to 67%, indicating broader integration into formal economic systems. Infrastructure expansion alone did not account for these outcomes, as all three sites had pre-existing connectivity prior to program implementation.

The substantial increase in digital literacy scores suggests that structured community-based training effectively enhanced participants' competencies in online communication, digital transactions, and cybersecurity awareness. Gains in employment stability and entrepreneurial activity indicate that digital skills translated into tangible economic opportunities. Income growth appears closely associated with the adoption of digital platforms for commerce and service provision.

The rise in financial inclusion rates reflects increased trust and familiarity with digital systems. Access to mobile banking and e-commerce platforms enabled participants to expand

customer bases and reduce transaction costs. These findings demonstrate that digital innovation at the community level functions as both a skills enhancement mechanism and an economic multiplier.

Qualitative interviews revealed recurring themes of empowerment, collaborative learning, and localized innovation. Participants described the community hub as a shared resource environment where peer mentoring and cooperative problem-solving facilitated sustained engagement. Local governance committees played an active role in identifying community needs and adapting training content accordingly.

Focus group discussions highlighted increased confidence in navigating digital platforms and negotiating online transactions. Women participants reported improved autonomy through home-based digital entrepreneurship. Observational data indicated high levels of peer interaction during training sessions, suggesting that social capital reinforced skill acquisition.

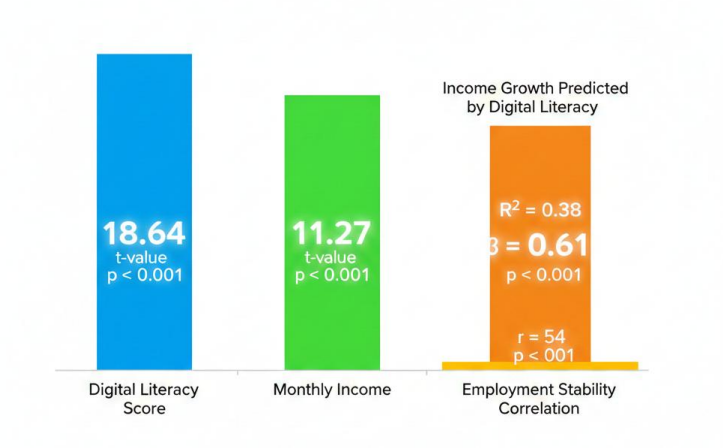

Figure 1. Paired-sample t-tests

Paired-sample t-tests indicated statistically significant improvements in digital literacy scores ($t = 18.64$, $p < 0.001$) and monthly income ($t = 11.27$, $p < 0.001$). Regression analysis demonstrated that digital literacy gains significantly predicted income growth ($\beta = 0.61$, $p < 0.001$), accounting for 38% of variance in post-intervention income levels ($R^2 = 0.38$). Employment stability improvements were also positively correlated with participation intensity ($r = 0.54$, $p < 0.01$).

Multivariate analysis controlling for age, gender, and baseline income confirmed that program participation remained a significant predictor of socioeconomic advancement ($F(4,175) = 22.83$, $p < 0.001$). Effect size calculations indicated moderate to strong practical impact across all outcome variables. Inferential results validate the statistical robustness of observed improvements.

Correlation analysis revealed a strong positive relationship between digital literacy and entrepreneurial engagement ($r = 0.63$, $p < 0.01$). Financial inclusion was significantly associated with employment stability ($r = 0.49$, $p < 0.01$). Participants demonstrating higher engagement in collaborative training sessions showed stronger income growth trajectories.

Qualitative data supported quantitative findings by illustrating how community governance structures facilitated sustained skill application. The relationship between social capital and economic resilience emerged as a mediating factor. Integration of digital innovation with participatory governance appears central to bridging structural digital inequality.

A case study from Site A involved a women's cooperative that transitioned from informal handicraft sales to an online marketplace model. Prior to program participation, cooperative members relied on local markets with limited revenue streams. Within nine months, digital marketing training enabled expansion to regional online platforms, increasing collective income by 58%.

Another case from Site C documented a youth-led digital repair and services hub. Participants initially lacked formal employment but possessed informal technical skills. Community-based mentorship and structured training facilitated certification and online service promotion, resulting in stable monthly earnings exceeding local minimum wage benchmarks.

The women's cooperative case demonstrates how digital literacy combined with collective governance enhances economic resilience. Online market access diversified revenue sources and reduced dependency on local demand fluctuations. Social cohesion within the cooperative supported risk-sharing and collective learning.

The youth-led hub illustrates the catalytic role of mentorship and skill formalization. Structured innovation spaces converted latent technical skills into monetizable services. Community endorsement increased credibility and client trust, reinforcing sustainable economic integration.

Findings indicate that community-based digital innovation significantly contributes to inclusive socioeconomic development by integrating skill enhancement, participatory governance, and economic opportunity. Digital access alone proved insufficient; structured community engagement and local capacity-building were essential to translating connectivity into measurable economic gains.

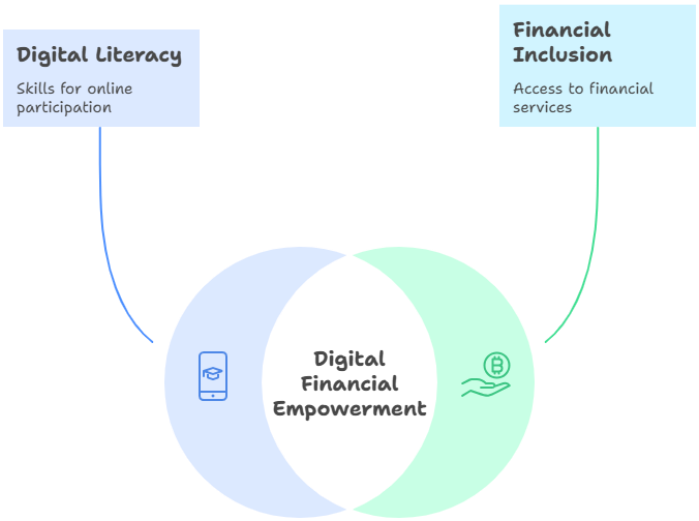

Figure 2. The Power of Synergy in Digital Inclusion

The convergence of statistical and qualitative evidence supports a model in which digital literacy, financial inclusion, and social capital function synergistically. Community-centered innovation ecosystems emerge as effective mechanisms for bridging the digital divide and fostering equitable participation in the digital economy.

The findings demonstrate that community-based digital innovation significantly contributes to bridging the digital divide and fostering inclusive socioeconomic development. Quantitative results reveal substantial improvements in digital literacy, income levels, employment stability, and entrepreneurial engagement among participants. Regression analysis confirms that gains in digital literacy are strong predictors of income growth and employment resilience. Financial inclusion rates increased markedly, indicating that participants were not only connected to digital infrastructure but also actively integrated into digital economic systems.

Program participation intensity emerged as a critical factor influencing socioeconomic outcomes. Individuals who engaged more consistently in training sessions and collaborative innovation activities showed higher income trajectories and stronger employment stability indices. Qualitative findings further highlight the importance of peer mentoring, participatory governance,

and community trust in sustaining digital engagement. Digital hubs functioned as social ecosystems rather than mere training centers.

Case studies reinforce statistical patterns by illustrating how cooperative entrepreneurship and youth-led digital service hubs translated digital skills into tangible economic gains. Collective governance structures enabled risk-sharing, local problem-solving, and strategic adaptation to market demands. Community ownership of innovation processes strengthened both accountability and sustainability. Economic benefits extended beyond individuals to broader community networks.

The convergence of quantitative and qualitative data indicates that digital access alone does not guarantee socioeconomic inclusion. Structured capacity-building, participatory leadership, and locally embedded innovation mechanisms are essential mediating variables. Digital innovation becomes transformative when integrated with community empowerment processes. The overall findings underscore the systemic nature of inclusive digital development.

The results align with scholarship emphasizing that digital inclusion must extend beyond infrastructure provision to encompass skills development and institutional support. Prior studies have highlighted the limitations of connectivity-focused interventions that fail to address social capital and governance factors. The present findings corroborate these arguments by demonstrating that community engagement mechanisms significantly enhance socioeconomic outcomes. Digital literacy improvements alone would likely have produced limited impact without participatory innovation structures.

Contrasts emerge when compared with research focusing on urban startup ecosystems as primary drivers of digital economic growth. Many innovation studies emphasize high-growth technology clusters and venture capital environments, often overlooking marginalized communities. The current findings suggest that grassroots innovation ecosystems can generate measurable economic gains even in resource-constrained contexts. Community-level interventions may therefore represent complementary, rather than secondary, drivers of digital development.

Research on the digital divide has traditionally conceptualized inequality in terms of access disparities. The present study extends this framework by illustrating the role of collaborative learning environments and local governance models in mediating digital outcomes. Integration of social empowerment theory with digital inclusion models strengthens explanatory depth. Digital transformation appears embedded within broader social structures rather than operating as an isolated technological phenomenon.

Existing literature on financial inclusion similarly underscores the role of digital platforms in expanding economic participation. The observed increase in digital financial service usage supports these findings while emphasizing the importance of trust-building and peer support mechanisms. Community endorsement and collective engagement appear to enhance adoption rates and sustainability. The study thus contributes to a more nuanced understanding of inclusive digital ecosystems.

The findings signify that digital innovation becomes inclusive only when rooted in community-based governance and collective agency. Technological access without social infrastructure risks reproducing existing inequalities. Community ownership of digital initiatives transforms passive recipients into active innovators. Empowerment emerges as both a process and an outcome of digital inclusion.

Improved employment stability and entrepreneurial engagement indicate that digital literacy functions as a gateway to economic resilience. Skills acquisition alone does not ensure transformation unless accompanied by market integration and institutional support. The integration

of digital competencies with local economic networks enhances adaptive capacity. Socioeconomic mobility thus becomes intertwined with digital capability.

Enhanced participation of women and youth in digital economic activities signals broader shifts in social inclusion dynamics. Digital platforms reduce structural barriers to market entry and enable flexible forms of entrepreneurship. Community-based support structures mitigate risks associated with digital experimentation. Inclusion expands when technological opportunity aligns with localized social empowerment.

The interplay between social capital and digital innovation highlights the relational dimension of technological adoption. Trust, collaboration, and shared governance reinforce sustained engagement. Digital ecosystems thrive when embedded within participatory social frameworks. The findings signal a transition from infrastructure-centered models toward socially integrated digital development paradigms.

Policy implications include the necessity of integrating community empowerment strategies into national digital development plans. Infrastructure investment should be complemented by participatory training programs and local innovation hubs. Sustainable digital inclusion requires multi-level coordination between governments, civil society organizations, and local leaders. Resource allocation strategies must account for social capital development alongside technological deployment.

Educational programs should incorporate collaborative learning models that foster peer mentoring and collective problem-solving. Capacity-building initiatives need to address not only technical skills but also entrepreneurial strategy and financial literacy. Institutional support mechanisms, including microfinance access and cooperative governance structures, strengthen economic sustainability. Holistic program design enhances long-term impact.

Development agencies may adopt community-based innovation ecosystems as scalable models for inclusive growth. Evidence from this study supports investment in localized digital hubs rather than centralized, top-down platforms. Targeted support for women's cooperatives and youth-led initiatives amplifies equity outcomes. Inclusive digital transformation depends on context-sensitive and participatory frameworks.

Scholarly implications extend to interdisciplinary integration between information systems, development economics, and community empowerment research. Future digital divide analyses should incorporate relational and institutional dimensions. Evidence-based models can guide more equitable digital policy formation. The findings contribute to reorienting digital development discourse toward inclusive socioeconomic resilience.

Digital literacy enhances human capital, yet human capital translates into economic value only within supportive ecosystems. Community-based innovation provides the structural conditions necessary for skill application. Peer networks facilitate knowledge diffusion and reinforce accountability. Collective governance reduces uncertainty and encourages experimentation.

Economic transformation requires trust in digital platforms and financial systems. Community endorsement and participatory leadership strengthen perceived legitimacy and reduce adoption barriers. Social capital mitigates fear associated with technological change. Sustainable engagement depends on relational reinforcement rather than isolated training sessions.

Resource pooling and cooperative models reduce entry costs for digital entrepreneurship. Shared infrastructure, mentorship, and market access increase efficiency and resilience. Distributed innovation mitigates risk concentration. Economic diversification becomes feasible within collaborative frameworks.

Contextual adaptation explains the effectiveness of grassroots digital innovation. Localized solutions align technological tools with community needs and cultural norms. Participatory design increases relevance and ownership. Structural integration between digital skills and local economic realities produces measurable socioeconomic outcomes.

Future research should expand longitudinal analysis to assess sustainability of socioeconomic gains beyond initial intervention periods. Examination of intergenerational effects would clarify long-term community impact. Multi-country comparative studies could enhance generalizability and identify contextual moderators.

Integration of advanced data analytics may strengthen evaluation of digital innovation ecosystems. Measurement of network effects and spillover benefits would provide deeper insight into community-level impact. Collaboration with policymakers could facilitate experimental policy pilots grounded in evidence.

Program design should emphasize scalability without sacrificing participatory integrity. Hybrid models combining digital platforms with localized mentorship networks warrant exploration. Targeted inclusion strategies for marginalized subgroups require further refinement.

Theoretical advancement should continue synthesizing digital inclusion, social capital theory, and innovation ecosystem frameworks. Interdisciplinary scholarship can enrich understanding of inclusive digital transformation. Ongoing empirical validation will strengthen policy relevance and contribute to equitable socioeconomic development in digitally evolving societies.

CONCLUSION

The most significant finding of this study lies in the empirical demonstration that community-based digital innovation functions as a structural bridge between technological access and measurable socioeconomic advancement. Digital literacy improvement alone did not automatically generate inclusive growth; rather, transformative outcomes emerged when skill development was embedded within participatory governance, peer collaboration, and localized innovation ecosystems. Statistical evidence confirmed that gains in digital competence significantly predicted increases in income, employment stability, and entrepreneurial engagement, while qualitative findings revealed that social capital and collective ownership acted as critical mediating variables. Community-driven digital hubs therefore operate not merely as training centers but as integrated socio-economic platforms that convert connectivity into sustainable economic participation.

The primary contribution of this research is conceptual and methodological. Conceptually, the study advances an integrative framework that synthesizes digital inclusion theory, community empowerment models, and innovation ecosystem perspectives into a unified analytical structure. This framework moves beyond infrastructure-centric models by demonstrating how grassroots governance and collaborative learning mediate digital impact. Methodologically, the use of a mixed-methods, multi-site comparative design strengthens causal inference and contextual interpretation, linking quantitative socioeconomic indicators with qualitative insights into institutional dynamics. The study offers a replicable and evidence-based model for designing inclusive digital development initiatives grounded in local capacity-building.

Several limitations warrant acknowledgment and provide direction for future research. The study's geographical scope and time frame limit the ability to assess long-term sustainability and cross-regional variability. Longitudinal investigations are needed to evaluate whether observed income and employment gains persist over extended periods. Expanded comparative studies across diverse national contexts would enhance generalizability and refine the proposed framework. Future research may also incorporate network analysis and advanced econometric modeling to examine

spillover effects and intergenerational impacts of community-based digital innovation on inclusive socioeconomic resilience.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the author(s) used ChatGPT to assist in improving grammar, language quality, and overall readability of the text. After using this tool, the author(s) carefully reviewed and edited the content as necessary and take full responsibility for the content of the publication.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

Author 4: Formal analysis; Methodology; Writing - original draft.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in the paper.

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