



Strengthening Digital Literacy for Micro, Small, and Medium Enterprises through Community-Based Training: Enhancing Business Sustainability, Financial Management, and Digital Marketing Competencies

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Abstract

Micro, Small, and Medium Enterprises (MSMEs) continue to face significant challenges in adapting to the rapidly evolving digital economy due to limited digital literacy, inadequate financial management capabilities, and insufficient strategic competencies to sustain long-term business growth. These constraints reduce their competitiveness and limit their ability to capitalize on emerging digital market opportunities. This study aimed to strengthen digital literacy among MSMEs through a community-based training program designed to enhance digital marketing competencies, financial management capabilities, and business sustainability. The program employed a participatory action-based community service approach using a mixed-method evaluation design that integrated quantitative pre-test and post-test assessments with qualitative observations of participant engagement, learning processes, and practical implementation. Forty-five MSME owners from the culinary, fashion, handicraft, and household product sectors participated in a structured six-week intervention consisting of digital literacy education, digital marketing practice, financial management training, business sustainability workshops, mentoring, and evaluation. The findings demonstrate that the intervention substantially improved participants' competencies across all measured dimensions, with digital marketing competence increasing by 73.4%, financial management competence by 58.2%, and business sustainability competence by 54.2%, resulting in an overall competency improvement of 61.1%. Participants also reported a high level of satisfaction with the training (overall mean score = 4.67), while the majority expressed strong commitment to continuing digital marketing activities, implementing digital financial recording systems, and participating in peer-learning networks after program completion. These findings indicate that community-based digital literacy training provides an effective and sustainable model for strengthening entrepreneurial capacity by integrating technological competencies with managerial and strategic capabilities. The study contributes to the literature by proposing an integrated community empowerment framework that links digital literacy, financial governance, and business sustainability as interconnected drivers of MSME resilience and inclusive economic development.

Keywords: Community-Based Training; Digital Literacy; Digital Marketing Competence; Financial Management; MSME Sustainability.



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INTRODUCTION

The rapid evolution of digital technologies has fundamentally reshaped the global economic landscape by redefining how enterprises create value, access markets, manage financial resources, and sustain competitive advantages in increasingly interconnected business ecosystems. Within this transformation, Micro, Small, and Medium Enterprises (MSMEs) have become central actors in economic resilience and inclusive development, yet their capacity to participate effectively in digital economies remains uneven across regions, particularly in emerging economies where technological adoption is constrained by limited digital competencies, inadequate financial literacy, and restricted access to digital infrastructure. The acceleration of e-commerce platforms, digital payment systems, and data-driven marketing strategies has intensified the necessity for MSMEs to develop multidimensional digital capabilities that extend beyond basic technology usage toward strategic business adaptation and

long-term sustainability (Sutrisno & Junaidi, 2025). Contemporary community development initiatives have increasingly recognized digital literacy as a critical intervention mechanism for strengthening entrepreneurial capacity, improving market responsiveness, and enhancing the socio-economic contribution of MSMEs within digitally mediated economies.

Previous studies have demonstrated that digital literacy interventions generate significant improvements in MSME performance by enhancing entrepreneurs' ability to utilize online marketing channels, optimize customer engagement, and integrate digital financial practices into business operations. Research conducted by Latief et al. (2026) revealed that structured mentoring programs combining digital marketing assistance and financial literacy development can strengthen entrepreneurial confidence and improve the operational capabilities of MSME actors. Similar findings indicate that community-based digital literacy programs focusing on e-commerce utilization have expanded rural entrepreneurs' awareness of online business opportunities while improving their ability to navigate digital marketplaces effectively (Sitorus et al., 2025). These findings collectively suggest that digital literacy is not merely a technological competency but represents a strategic entrepreneurial resource that influences innovation capacity, financial decision-making, and business sustainability.

Despite substantial evidence regarding the positive implications of digital literacy programs, existing literature remains fragmented in conceptualizing digital empowerment among MSMEs because many studies examine digital marketing skills, financial literacy, or technology adoption as isolated dimensions rather than as interconnected capabilities within an integrated sustainability framework. Titin et al. (2025) emphasized that digital literacy, entrepreneurship education, and institutional support collectively stimulate innovation and competitiveness among micro enterprises, yet the interaction between these components requires deeper exploration through holistic community-based approaches. Studies focusing on digital marketing mentoring have also confirmed improvements in promotional capabilities and market access, although several interventions remain concentrated on short-term skill transfer without adequately addressing continuous adaptation, financial management competence, and strategic sustainability planning (Widiati & Saragih, 2025). This conceptual limitation indicates the need for research models that position digital literacy as a comprehensive empowerment mechanism linking technological proficiency, entrepreneurial resilience, and sustainable business practices.

The empirical gap becomes more apparent when examining the diverse challenges experienced by MSMEs operating in vulnerable and transitional economic environments, where limited digital capabilities frequently intersect with weak managerial practices, insufficient financial governance, and restricted market adaptability. Doktoralina et al. (2025) proposed that digital transformation among small enterprises requires an integrated framework that combines technological adoption with organizational readiness and sustainability-oriented strategies, demonstrating that digital transformation cannot be achieved through technological exposure alone. Similar community intervention studies have highlighted that women, youth, and rural entrepreneurs often require contextualized training models that accommodate differences in educational background, resource availability, and entrepreneurial experience (Anisyah et al., 2025). These conditions reveal a practical and theoretical challenge concerning how community-based training can effectively bridge the digital capability gap while simultaneously fostering sustainable entrepreneurial development.

The urgency of addressing this issue is reinforced by the growing dependence of MSMEs on digital ecosystems, where businesses lacking adequate digital competencies face increasing risks of market exclusion, declining competitiveness, and limited growth opportunities. Hamidi et al. (2025) demonstrated that strengthening digital skills and market adaptability among marginalized entrepreneurs contributes significantly to improving their capacity to respond to economic changes and emerging market demands. However, many existing empowerment programs still prioritize introductory digital literacy training without sufficiently evaluating how acquired competencies influence business sustainability, financial management effectiveness, and long-term strategic decision-making. This unresolved issue creates a critical need for community-based research that investigates digital literacy training as an integrated intervention capable of producing measurable improvements in multiple dimensions of MSME development.

Recent scholarship has increasingly shifted from viewing digital literacy as an individual technological skill toward understanding it as a strategic capability embedded within entrepreneurial ecosystems, community structures, and institutional support mechanisms. Febriani et al. (2026) argued that the combination of entrepreneurship education and digital literacy provides a stronger foundation

for improving MSME competitiveness because digital competencies become more meaningful when integrated with managerial knowledge and innovation-oriented thinking. Community-driven approaches have also been identified as effective mechanisms for ensuring that digital transformation initiatives align with local conditions, entrepreneurial realities, and sustainability objectives rather than imposing standardized technological solutions (Saraswati et al., 2025). This research positions itself within this evolving discourse by examining digital literacy strengthening through community-based training as an integrated pathway for enhancing MSME sustainability, financial management competence, and digital marketing capabilities.

The methodological orientation of this study responds to limitations in previous research that predominantly evaluates digital literacy programs through singular outcomes, such as increased online visibility or improved technology awareness, without capturing the broader transformation process experienced by MSME participants. The community-based training framework adopted in this research seeks to provide a more comprehensive understanding of how targeted educational interventions can facilitate knowledge acquisition, behavioral change, and practical application of digital competencies within real business contexts. By integrating dimensions of business sustainability, financial management, and digital marketing, this study contributes to expanding the analytical framework of MSME empowerment beyond conventional digital adoption perspectives. The research approach further emphasizes the importance of participatory learning environments in creating sustainable capacity-building models that are responsive to entrepreneurial needs.

This study aims to strengthen digital literacy among MSMEs through a community-based training approach designed to enhance business sustainability, financial management capabilities, and digital marketing competencies. The research contributes theoretically by enriching discussions on digital transformation and entrepreneurial empowerment through an integrated perspective that connects technological competence with strategic business development. The study also provides methodological contributions by demonstrating how community-based interventions can be structured as practical mechanisms for translating digital literacy concepts into measurable entrepreneurial improvements. Through this contribution, the research seeks to support the development of more adaptive, inclusive, and sustainable MSME empowerment strategies within the continuously evolving digital economy.

METHOD

Research Design and Community Engagement Approach

This community service program employed a participatory action-based approach designed to strengthen digital literacy competencies among Micro, Small, and Medium Enterprises (MSMEs) through structured community-based training activities. The methodological framework was developed by integrating digital marketing education, financial management improvement, and business sustainability practices as interconnected components of MSME capacity development. The program was conducted using a mixed-method evaluation approach, combining quantitative measurement through pre-test and post-test assessments with qualitative observation of participant engagement, learning processes, and practical implementation outcomes. The intervention was implemented in collaboration with local MSME communities to ensure that training materials reflected actual entrepreneurial challenges and contextual business needs.

The participants consisted of MSME owners operating in food processing, fashion, handicraft, and household product sectors, which were selected through purposive sampling based on their active business status and willingness to participate in digital transformation activities. The selection criteria emphasized enterprises that had limited experience in digital marketing, financial recording systems, and online business platforms. The demographic and business characteristics of participants are presented in Table 1.

Table 1. Characteristics of MSME Participants Involved in Community-Based Digital Literacy Training

No.	Participant Characteristics	Category	Number Participants	of Percentage (%)
1	Gender	Male	18	40.0
		Female	27	60.0
2	Age	20–30 years	12	26.7
		31–40 years	19	42.2
		41–50 years	10	22.2
		>50 years	4	8.9
3	Business Sector	Culinary/Food Processing	20	44.4
		Fashion and Apparel	9	20.0
		Handicraft	8	17.8
		Household Products	8	17.8
4	Business Duration	<3 years	14	31.1
		3–5 years	18	40.0
		>5 years	13	28.9

Table 1 indicates that the majority of participants were female MSME entrepreneurs, representing 60% of the total participants involved in the program. The dominant age category was 31–40 years, suggesting that most participants were entrepreneurs in their productive age with established business experience. The culinary sector represented the largest proportion of participating businesses, indicating that food-based MSMEs were among the most interested groups in adopting digital marketing strategies.

Training Framework and Implementation Stages

The training intervention was designed based on a sequential learning model consisting of preparation, digital literacy training, practical implementation, mentoring, and evaluation stages. The program emphasized experiential learning principles by combining theoretical explanations with direct business application activities, including digital branding development, online marketplace optimization, financial record preparation, and social media marketing practices. The implementation stages were structured to ensure that participants not only acquired digital knowledge but also developed practical competencies applicable to their businesses. The overall training workflow is illustrated in Figure 1.

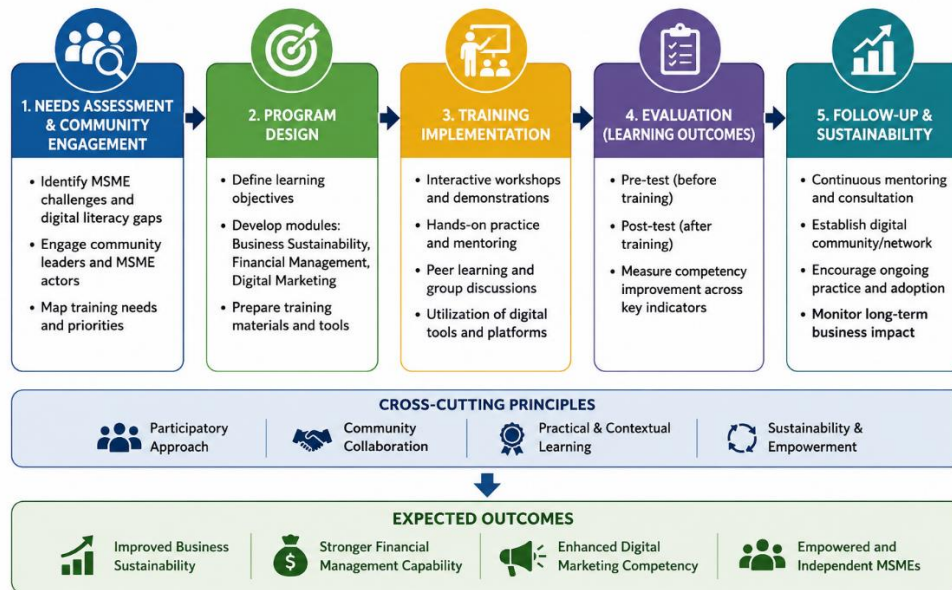


Figure 1. Community-Based Digital Literacy Training Implementation Framework

The training framework demonstrates that the intervention was developed through a systematic process beginning with identification of participant needs and continuing through competency development activities. The three main training components were digital marketing, financial management, and business sustainability because these areas represent fundamental capabilities required for MSME adaptation in digital economic environments. The mentoring stage was incorporated to ensure that participants could transform training knowledge into practical business improvements. The detailed implementation schedule is presented in Table 2.

Table 2. Implementation Schedule of Digital Literacy Training Program

Stage	Main Activities	Duration	Output
Preparation	Participant identification, initial survey, and training material development	Week 1	Participant database and training framework
Digital Literacy Session	Introduction to digital platforms, social media utilization, and online business strategies	Week 2	Increased digital awareness
Digital Marketing Practice	Content creation, product photography, marketplace optimization, and customer engagement strategies	Week 3	Digital marketing profiles and promotional materials
Financial Management Training	Simple bookkeeping, digital financial recording, and cash flow management	Week 4	Basic financial management system
Business Sustainability Session	Business planning, customer retention, and innovation strategies	Week 5	Sustainability improvement plans
Mentoring and Evaluation	Individual consultation and competency assessment	Week 6	Performance evaluation report

Table 2 presents the six-week implementation structure developed to gradually improve MSME competencies through integrated training activities. The program allocated specific stages for knowledge acquisition, practical application, and continuous mentoring to maximize learning

effectiveness. The final evaluation stage was conducted to measure changes in participant capabilities and identify areas requiring further improvement.

Training Materials and Competency Indicators

The learning materials were developed based on three primary competency dimensions: digital marketing capability, financial management capability, and business sustainability awareness. Each dimension consisted of measurable indicators used to evaluate participant development before and after training implementation. The competency indicators were adapted to the practical requirements of small business operators who require applicable knowledge rather than purely theoretical understanding.

Table 3. Training Competency Dimensions and Measurement Indicators

Competency Dimension	Indicators	Measurement Scale
Digital Competence	Marketing Social media utilization, digital content creation, marketplace management, online customer interaction	1–5 Likert Scale
Financial Competence	Management Financial recording, expense monitoring, revenue analysis, digital financial tools utilization	1–5 Likert Scale
Business Competence	Sustainability Business planning, innovation capability, customer retention strategies, market adaptation	1–5 Likert Scale

Table 3 explains the competency framework used to assess the effectiveness of the digital literacy intervention among MSME participants. Digital marketing competence focused on participants' ability to utilize online platforms as business development instruments rather than merely promotional channels. Financial management and sustainability competencies were included because digital transformation requires managerial readiness and long-term strategic thinking.

Evaluation Method and Data Analysis

Program effectiveness was evaluated by comparing participant competency levels before and after training using pre-test and post-test measurements. A structured questionnaire containing 12 assessment indicators was distributed to all participants, covering digital marketing, financial management, and sustainability competencies. The evaluation results were analyzed using descriptive statistical analysis to identify changes in participant knowledge and skills after completing the training program.

Table 4. Pre-Test and Post-Test Results of MSME Digital Literacy Competencies

Competency Dimension	Pre-Test Score	Mean Post-Test Score	Mean Improvement (%)
Digital Marketing Competence	2.41	4.18	73.4
Financial Management Competence	2.56	4.05	58.2
Business Sustainability Competence	2.73	4.21	54.2
Overall Competency Average	2.57	4.15	61.1

Table 4 demonstrates significant improvements across all competency dimensions following the implementation of community-based training. Digital marketing competence experienced the highest percentage increase because most participants previously had limited experience in utilizing digital platforms for business expansion. The overall competency improvement of 61.1% indicates that the intervention effectively enhanced MSME participants' readiness to adopt digital practices in their entrepreneurial activities.

Ethical Considerations and Sustainability Strategy

The implementation of this community service program followed ethical principles by ensuring voluntary participation, informed consent, confidentiality of participant information, and equal access to training resources. Participants were informed regarding the objectives, procedures, and expected outcomes of the program before the training activities commenced. The sustainability strategy was designed through continuous mentoring mechanisms and the establishment of peer-support networks among MSME participants to encourage long-term knowledge exchange.

Table 5. Sustainability Mechanisms After Training Completion

Sustainability Component	Implementation Strategy	Expected Outcome
Digital Practice Continuity	Monthly digital marketing monitoring	Consistent online business activity
Peer Learning Network	MSME community discussion forum	Continuous knowledge exchange
Business Evaluation	Periodic financial and marketing review	Improved decision-making capacity
Advanced Mentoring	Follow-up consultation sessions	Long-term digital adaptation

Table 5 highlights the sustainability mechanisms developed to maintain the benefits of the training beyond the intervention period. Continuous monitoring and peer-based learning were considered essential because digital transformation requires adaptive learning processes rather than one-time training activities. The sustainability strategy ensures that MSME participants can progressively strengthen their digital capabilities and maintain business competitiveness in dynamic market environments.

RESULT AND DISCUSSION

Participant Characteristics

The community-based digital literacy training involved 45 Micro, Small, and Medium Enterprise (MSME) owners representing several business sectors. The participant profile was analyzed to understand the demographic composition of the training beneficiaries and to provide contextual information regarding the implementation of the community service program.

Table 1. Characteristics of MSME Participants

Characteristics	Category	n	Percentage (%)
Gender	Male	18	40.0
	Female	27	60.0
Age	20–30 years	12	26.7
	31–40 years	19	42.2
	41–50 years	10	22.2
	>50 years	4	8.9
Business Sector	Culinary/Food Processing	20	44.4
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	Handicraft	8	17.8
	Household Products	8	17.8
Business Duration	<3 years	14	31.1
	3–5 years	18	40.0
	>5 years	13	28.9

The participant profile demonstrates that female entrepreneurs constituted the majority of the training participants, accounting for 60.0% of the total sample. Most MSME owners were between 31 and 40 years old (42.2%), indicating that the program primarily reached entrepreneurs in their productive business development stage. The culinary sector represented the largest proportion of participating enterprises (44.4%), reflecting the high demand for digital business development within food-related industries. Regarding business experience, 40.0% of participants had operated their businesses for three to five years, suggesting that most enterprises had established operational foundations while still requiring capacity strengthening for digital transformation.

Implementation of Community-Based Digital Literacy Training

The implementation of the community service program followed a structured six-week intervention consisting of sequential learning activities beginning with participant preparation and ending with mentoring and evaluation.

Table 2. Implementation of Community-Based Digital Literacy Training

Stage	Main Activities	Duration	Output
Preparation	Participant identification, initial survey, material preparation	Week 1	Participant database
Digital Session	Literacy Introduction to digital platforms and online business	Week 2	Increased digital awareness
Digital Practice	Marketing Product photography, marketplace optimization, content creation	Week 3	Digital marketing profiles
Financial Training	Management Bookkeeping and digital financial recording	Week 4	Financial recording system
Business Session	Sustainability Business planning and innovation strategy	Week 5	Sustainability improvement plans
Mentoring and Evaluation	Consultation and competency assessment	Week 6	Evaluation report

The implementation process demonstrates that the training program was organized through a systematic progression from needs assessment to competency evaluation. Each stage was designed to build participants' knowledge incrementally while allowing sufficient opportunities for practical application. The inclusion of mentoring activities after the instructional sessions enabled participants to receive individualized guidance regarding challenges encountered during implementation. Overall, the structured six-week framework ensured that theoretical learning was effectively translated into practical digital business competencies.

Improvement of Digital Literacy Competencies

The effectiveness of the community service intervention was evaluated through pre-test and post-test assessments measuring three competency dimensions.

Table 3. Pre-Test and Post-Test Results of MSME Competencies

Competency Dimension	Pre-Test	Post-Test	Improvement (%)
Digital Marketing Competence	2.41	4.18	73.4
Financial Management Competence	2.56	4.05	58.2
Business Sustainability Competence	2.73	4.21	54.2
Overall Average	2.57	4.15	61.1

The findings reveal substantial improvements across all competency dimensions following the implementation of the community-based digital literacy training. Digital marketing competence exhibited the greatest improvement, increasing by 73.4%, indicating that participants significantly enhanced their ability to utilize online platforms and digital promotional strategies. Financial management competence also improved considerably, reflecting participants' increased capability to manage financial records and monitor business performance using digital tools. Overall, the average competency score increased from 2.57 to 4.15, representing a 61.1% improvement and demonstrating the effectiveness of the integrated training model in strengthening MSME digital capabilities.

Participant Competency Achievement after Training

To provide a more comprehensive overview of participant learning outcomes, competency achievement was classified into three performance categories based on post-test scores.

Table 4. Distribution of Participant Competency Achievement

Competency Level	Number of Participants	Percentage (%)
High	30	66.7
Moderate	12	26.7
Basic	3	6.6
Total	45	100.0

The competency distribution indicates that two-thirds of the participants successfully achieved a high level of digital competency following completion of the training program. Approximately one-quarter of participants reached a moderate competency level, suggesting that they acquired sufficient knowledge while still requiring additional practice for optimal implementation. Only a small proportion of participants remained within the basic competency category, indicating that the intervention was broadly effective across different participant backgrounds. These findings suggest that the community-based training model successfully facilitated competency improvement among the majority of participating MSMEs.

Participant Satisfaction toward the Community-Based Training Program

Participant perceptions regarding the implementation quality were evaluated at the conclusion of the program using a five-point Likert scale.

Table 5. Participant Satisfaction toward the Training Program

Evaluation Aspect	Mean Score
Training Materials	4.68
Instructor Competence	4.76
Practical Activities	4.71
Mentoring Process	4.64
Training Facilities	4.55
Overall Satisfaction	4.67

The evaluation results demonstrate a high level of participant satisfaction with the implementation of the community-based digital literacy program. Instructor competence received the highest average score, indicating that participants perceived the facilitators as knowledgeable and capable of delivering practical learning experiences. Practical training activities also obtained high ratings because participants were able to directly apply newly acquired digital skills to their business contexts. The overall satisfaction score of 4.67 suggests that the training design successfully addressed participant expectations while providing relevant competencies for sustainable MSME development.

Sustainability Commitment after Program Completion

The sustainability of the intervention was assessed by examining participants' commitment to continue implementing digital practices after the formal training had concluded.

Table 6. Participant Commitment toward Sustainable Digital Business Practices

Sustainability Commitment	Participants Percentage (%)	
Continue digital marketing activities	42	93.3
Continue digital financial recording	39	86.7
Participate in peer-learning community	37	82.2
Attend follow-up mentoring sessions	35	77.8

The post-program evaluation indicates that the majority of participants expressed strong intentions to continue applying the competencies acquired during the training. Digital marketing activities received the highest commitment level, demonstrating participants' recognition of online promotion as an essential strategy for business growth. A substantial proportion of MSME owners also committed to maintaining digital financial records and participating in peer-learning communities, highlighting the sustainability of the intervention beyond the formal training period. These findings indicate that the community-based training approach not only improved participant competencies but also fostered long-term motivation to sustain digital transformation within their businesses.

Discussion on Participant Characteristics and Community Readiness

The demographic profile of the participants provides important insights into the readiness of Micro, Small, and Medium Enterprises (MSMEs) to engage in digital transformation initiatives through community-based interventions. The findings revealed that female entrepreneurs constituted 60.0% of the participants, while the largest age group was between 31 and 40 years (42.2%). Furthermore, the culinary sector represented the largest business category (44.4%), and most businesses had operated for three to five years (40.0%). These characteristics indicate that the program primarily reached entrepreneurs who had already established their business operations but continued to face challenges in adapting to the rapidly evolving digital business environment. Rather than targeting newly established enterprises, the intervention focused on MSMEs that possessed sufficient operational experience but required strategic capacity enhancement to improve competitiveness and sustainability in the digital economy.

From the perspective of community empowerment theory, participant readiness extends beyond demographic characteristics and encompasses the willingness of individuals to engage in collective learning processes and adopt innovative business practices. The predominance of entrepreneurs in their productive age reflects a population that is generally more receptive to technological innovation while simultaneously possessing practical business experience that facilitates knowledge application. Community-based empowerment emphasizes participatory learning, collaborative problem-solving, and knowledge sharing as essential mechanisms for sustainable capacity development. Consequently, the demographic composition observed in this study created favorable conditions for implementing participatory digital literacy training because participants were able to integrate newly acquired competencies with their existing entrepreneurial experiences. This finding aligns with the argument that community-oriented digital literacy programs become more effective when participants actively contribute their business experiences throughout the learning process rather than functioning solely as passive recipients of information (Raharjo & Rofiuddin, 2026; Maharani et al., 2026).

The dominance of culinary MSMEs also reflects broader patterns of digital transformation occurring within Indonesia's local economy. Food-related enterprises increasingly depend on social media promotion, online food delivery platforms, digital payment systems, and customer relationship management to maintain market competitiveness. Consequently, entrepreneurs operating in this sector experience greater urgency to improve digital marketing competencies than businesses relying primarily on conventional marketing channels. Similar observations have been reported in previous

community empowerment studies, which demonstrate that digital literacy significantly improves marketing performance, customer engagement, and business adaptability among food-based and household MSMEs (Rujitoningtyas et al., 2024; Husna et al., 2025). Moreover, digital marketing training has been shown to encourage entrepreneurs to diversify promotional strategies while strengthening their resilience against market uncertainty through expanded online market access (Prasetyo et al., 2025; Helmi et al., 2025). Therefore, the participant composition observed in this study represents an appropriate target group for interventions designed to strengthen digital business competencies through structured community engagement.

Another important finding concerns the business maturity of participating enterprises, where nearly seventy percent of MSMEs had operated for at least three years. Business longevity indicates that entrepreneurs had accumulated operational knowledge but still encountered limitations in digital capability, financial management, and strategic innovation. This condition supports the view that sustainable MSME development depends not only on business survival but also on continuous organizational learning and technological adaptation. Community-based empowerment programs therefore function as strategic instruments for bridging the gap between entrepreneurial experience and digital capability by integrating practical training, mentoring, and collaborative learning environments. Previous studies consistently report that combining entrepreneurship education, digital literacy, financial management, and institutional collaboration produces stronger and more sustainable business outcomes than isolated technology training initiatives (Sutrisno & Junaidi, 2025; Chandra, 2022; Purnomo & Purwandari, 2025; Mawardi et al., 2025). Accordingly, the participant characteristics identified in this study demonstrate that the selected MSMEs possessed both the readiness and the developmental needs required to maximize the effectiveness of community-based digital literacy interventions, thereby establishing a solid foundation for subsequent improvements in marketing capability, financial governance, and long-term business sustainability.

Discussion on the Effectiveness of Community-Based Digital Literacy Training

The implementation of the community-based digital literacy training demonstrated that participatory learning can effectively strengthen the entrepreneurial competencies of MSME owners. The results presented in Table 3 indicate that the overall competency score increased from 2.57 in the pre-test to 4.15 in the post-test, representing an overall improvement of 61.1%. This substantial increase suggests that the six-week intervention successfully facilitated knowledge acquisition and practical skill development by integrating digital marketing, financial management, and business sustainability into a comprehensive training framework. Unlike conventional lecture-based approaches, the training emphasized experiential learning through demonstrations, hands-on practice, mentoring, and collaborative discussions, allowing participants to immediately apply newly acquired knowledge to their business activities. These findings reinforce the argument that community-based capacity-building initiatives create a more sustainable learning environment because participants actively construct knowledge through interaction and real business experiences rather than passively receiving information (Sutrisno & Junaidi, 2025; Maharani et al., 2026).



Figure 2. Community-Based Digital Literacy Training Activities for MSME Participants

Figure 2 illustrates the learning atmosphere during community-based digital literacy activities, where participants engaged directly with digital devices, practical exercises, and facilitator guidance

without exposing individual identities. The learning environment reflects the participatory approach adopted throughout the intervention, emphasizing collaborative problem-solving, practical demonstrations, and direct application of digital tools within authentic entrepreneurial contexts. Such a setting encourages participants to exchange experiences, discuss operational challenges, and collectively identify appropriate digital solutions for their businesses. According to participatory learning theory, practical engagement and peer interaction significantly enhance knowledge retention and facilitate long-term behavioral change because learning is contextualized within participants' everyday experiences (Raharjo & Rofiuddin, 2026; Purnomo et al., 2026).

The remarkable improvement in digital marketing competence (73.4%) demonstrates that the training content effectively addressed one of the most critical challenges encountered by MSMEs in the digital economy. Prior to the intervention, many participants possessed limited experience in utilizing online marketplaces, developing promotional content, or managing customer engagement through social media platforms. Following the training, participants demonstrated greater confidence in creating digital branding strategies, optimizing product photography, utilizing marketplace features, and interacting with customers through online communication channels. These outcomes are consistent with previous studies indicating that digital marketing mentoring enhances market accessibility, strengthens brand visibility, and improves entrepreneurial competitiveness by enabling MSMEs to respond more effectively to evolving consumer behavior (Latief et al., 2026; Widiati & Saragih, 2025; Sitorus et al., 2025). Similar findings have also been reported by Saraswati et al. (2025), Helmi et al. (2025), Trisninawati and Sartika (2024), Husna et al. (2025), and Prasetyo et al. (2025), who concluded that practical digital marketing education significantly improves business promotion capabilities and supports sustainable enterprise development through broader digital market penetration.

The improvements observed in financial management competence (58.2%) and business sustainability competence (54.2%) further indicate that the intervention generated multidimensional benefits extending beyond digital technology adoption. Participants became more capable of maintaining digital financial records, monitoring business cash flow, evaluating operational performance, and integrating long-term planning into their business decision-making processes. These managerial improvements demonstrate that digital literacy should be understood not merely as technological proficiency but as a strategic capability that supports organizational resilience, adaptive capacity, and sustainable enterprise growth. Previous research consistently emphasizes that combining digital literacy with financial management education and entrepreneurship development produces more comprehensive improvements in MSME performance than technology-oriented interventions alone (Anggara & Djamaluddin, 2024; Fadilah et al., 2025; Simbolon et al., 2025; Umiyati et al., 2025). Likewise, Doktoralina et al. (2025), Titin et al. (2025), Putri et al. (2025), Chandra (2022), and Naayif et al. (2025) argued that sustainable digital transformation requires the integration of technological capability, innovation, strategic planning, and organizational readiness. Therefore, the findings of this study confirm that community-based digital literacy training constitutes an effective empowerment strategy capable of strengthening both the technical and managerial capacities of MSMEs, thereby supporting long-term business sustainability in increasingly competitive digital markets.

Discussion on the Improvement of Digital Marketing, Financial Management, and Business Sustainability Competencies

The findings of this study demonstrate that the community-based digital literacy intervention generated measurable improvements across the three principal competency domains evaluated during the program, namely digital marketing, financial management, and business sustainability. Based on the post-training evaluation, digital marketing competence recorded the highest improvement (73.4%), followed by financial management competence (58.2%) and business sustainability competence (54.2%). These findings indicate that the integrated training model effectively addressed multiple dimensions of entrepreneurial capacity rather than concentrating exclusively on technological skills. Such multidimensional competency development is essential because MSMEs require a combination of marketing capability, financial governance, and strategic planning to remain competitive within increasingly digitalized business environments. Previous studies similarly emphasize that digital transformation should be understood as a comprehensive organizational process involving technological adaptation, managerial capability, and entrepreneurial innovation rather than merely adopting digital tools (Doktoralina et al., 2025; Cornellia et al., 2025).

The highest improvement in digital marketing competence reflects the immediate applicability of the training materials to participants' daily business operations. Through practical sessions focusing on social media branding, content creation, product photography, marketplace optimization, and online customer engagement, participants were able to strengthen their promotional strategies and expand their digital market presence. The significant increase observed in this competency suggests that experiential learning combined with direct mentoring effectively accelerates technology adoption among MSMEs. These findings support previous community empowerment research demonstrating that practical digital marketing education substantially improves marketing performance, customer acquisition, and business competitiveness by enabling entrepreneurs to utilize digital platforms strategically rather than merely as communication tools (Latief et al., 2026; Widiati & Saragih, 2025). Similar conclusions were reported by Sitorus et al. (2025), Saraswati et al. (2025), Helmi et al. (2025), Trisninawati and Sartika (2024), Husna et al. (2025), Prasetyoningsih et al. (2025), and Rujitoningtyas et al. (2024), all of whom concluded that structured digital marketing training enhances entrepreneurial adaptability, strengthens branding effectiveness, and expands access to wider consumer markets.

The improvement in financial management competence demonstrates that digital literacy initiatives become considerably more valuable when accompanied by managerial capability development. Prior to the intervention, many participants experienced difficulties in maintaining systematic financial records, monitoring business cash flow, and evaluating operational performance. Following the training, participants demonstrated improved understanding of digital bookkeeping systems, financial reporting, expenditure monitoring, and data-driven decision making. These competencies contribute directly to better financial governance because entrepreneurs become capable of making more rational business decisions supported by accurate financial information. Previous research consistently highlights financial literacy as a critical determinant of MSME sustainability because effective financial management enables enterprises to optimize resource allocation, improve investment decisions, and strengthen resilience against market uncertainty (Anggara & Djamaluddin, 2024; Fadilah et al., 2025). Likewise, Umiyati et al. (2025) and Simbolon et al. (2025) reported that integrating financial management education with digital marketing training significantly enhances entrepreneurial confidence and organizational performance by strengthening both operational efficiency and financial accountability.

Business sustainability competence also experienced considerable improvement, indicating that participants developed broader strategic perspectives regarding long-term enterprise development beyond immediate commercial objectives. The training encouraged entrepreneurs to integrate innovation, customer retention strategies, adaptive business planning, and continuous digital learning into their organizational practices. This finding supports the contemporary view that sustainable entrepreneurship depends upon the ability of MSMEs to continuously adapt to technological developments while maintaining organizational resilience and competitive advantage. Entrepreneurship education integrated with digital literacy has been shown to strengthen innovation capacity and improve long-term competitiveness because entrepreneurs become more capable of responding proactively to market dynamics and technological change (Febriani et al., 2026; Titin et al., 2025). Furthermore, studies conducted by Putri et al. (2025), Purnomo and Purwandari (2025), Chandra (2022), Susanti and Nugrahaningsih (2026), Naayif et al. (2025), and Mawardi et al. (2025) emphasize that sustainable MSME development requires continuous learning, institutional collaboration, strategic market management, and community engagement. Therefore, the simultaneous improvement observed across digital marketing, financial management, and business sustainability competencies confirms that the community-based digital literacy model implemented in this study successfully strengthened both the technical and strategic capabilities required for sustainable MSME growth within the evolving digital economy.

Discussion on Participant Satisfaction and Community Engagement

Participant satisfaction represents one of the most important indicators for evaluating the effectiveness of community-based empowerment programs because it reflects not only the quality of training delivery but also the relevance of the learning experience to participants' practical needs. The findings of this study revealed a high overall satisfaction score (4.67 out of 5.00), with instructor competence (4.76) and practical training activities (4.71) receiving the highest evaluations. These results suggest that the training successfully aligned instructional content with the operational realities

encountered by MSME entrepreneurs. The positive evaluation further indicates that participants perceived the program as beneficial for improving their entrepreneurial capabilities, thereby increasing their willingness to engage actively throughout the intervention. Such outcomes reinforce the principle that effective community service programs should prioritize participant-centered learning environments that respond directly to local business challenges rather than relying solely on standardized educational approaches.

From the perspective of community engagement theory, participant satisfaction is closely associated with the degree of interaction, collaboration, and shared ownership established during program implementation. Community-based learning emphasizes active participation in every stage of the educational process, enabling participants to exchange experiences, identify common problems, and collaboratively develop practical solutions. In the present study, mentoring sessions, group discussions, and practical demonstrations created opportunities for MSME owners to learn not only from facilitators but also from fellow entrepreneurs facing similar business challenges. Such collaborative interactions strengthen participants' confidence while simultaneously fostering mutual support networks that extend beyond the formal training period. Previous studies have similarly demonstrated that community participation significantly enhances learning effectiveness because collaborative environments encourage knowledge sharing, strengthen entrepreneurial motivation, and facilitate continuous capacity development (Saraswati et al., 2025; Maharani et al., 2026). Likewise, Raharjo and Rofiuddin (2026) emphasized that participatory action approaches produce more sustainable empowerment outcomes because communities become actively involved in generating and applying new knowledge rather than functioning merely as training beneficiaries.

The high satisfaction reported toward instructor competence and practical learning activities also confirms the importance of experiential learning within digital literacy interventions. Participants consistently valued opportunities to practice digital marketing techniques, financial recording systems, and online business management under direct facilitator supervision. This practical orientation enabled immediate feedback, problem clarification, and contextual adaptation according to individual business characteristics, thereby increasing learning effectiveness. Previous community empowerment programs have similarly concluded that practical mentoring generates higher participant satisfaction than conventional lecture-based instruction because entrepreneurs can directly implement newly acquired competencies during the training process (Latief et al., 2026; Widiati & Saragih, 2025). Comparable findings were reported by Husna et al. (2025), Helmi et al. (2025), and Prasetyoningsih et al. (2025), who found that interactive digital marketing workshops significantly improved participant engagement, self-confidence, and readiness to adopt digital business practices. These studies collectively suggest that participant satisfaction emerges not only from high-quality instructional delivery but also from the opportunity to immediately apply learning outcomes within authentic business contexts.

Beyond evaluating program quality, participant satisfaction also reflects the development of stronger community engagement, which constitutes a fundamental element of sustainable MSME empowerment. The collaborative learning environment established during the training encouraged participants to build interpersonal networks, exchange entrepreneurial experiences, and continue communication after the formal intervention concluded. Such social interaction contributes to the formation of a learning community capable of sustaining knowledge exchange and supporting continuous business innovation. Community empowerment literature consistently emphasizes that long-term entrepreneurial development depends upon sustained collaboration among entrepreneurs, educational institutions, and local stakeholders rather than isolated training activities (Mawardi et al., 2025; Purnomo & Purwandari, 2025). Furthermore, Putri et al. (2025), Chandra (2022), and Cornellia et al. (2025) argued that community engagement strengthens organizational resilience by creating collaborative ecosystems that facilitate innovation, digital adaptation, and sustainable local economic development. Therefore, the high level of participant satisfaction observed in this study should be interpreted not only as evidence of successful program implementation but also as an indicator that the community-based approach effectively established a supportive entrepreneurial ecosystem capable of sustaining digital transformation among MSMEs.

CONCLUSION

This study demonstrates that strengthening digital literacy through a community-based training approach represents an effective strategy for enhancing the adaptive capacity of Micro, Small, and

Medium Enterprises (MSMEs) within an increasingly digitalized economic environment. Rather than focusing solely on technology adoption, the integrated intervention successfully positioned digital literacy as a multidimensional capability encompassing digital marketing, financial management, and business sustainability. The findings indicate that participatory learning, practical mentoring, and collaborative community engagement collectively facilitate the development of entrepreneurial competencies that support more resilient and innovation-oriented business practices. Accordingly, this study reinforces the perspective that sustainable MSME empowerment requires a holistic educational framework in which digital skills are integrated with managerial competencies and long-term strategic thinking.

From a theoretical perspective, this research contributes to the growing body of literature on community-based entrepreneurship empowerment by proposing an integrated framework that connects digital literacy, financial governance, and business sustainability within a single capacity-building model. Unlike many previous community service programs that evaluate digital literacy primarily through technological adoption or marketing outcomes, this study demonstrates that comprehensive competency development produces broader organizational benefits by strengthening strategic decision-making and entrepreneurial resilience. Practically, the findings provide valuable implications for universities, local governments, non-governmental organizations, and community development institutions seeking to design more effective digital empowerment programs for MSMEs. The structured combination of participatory learning, mentoring, and continuous evaluation offers a replicable implementation model that can be adapted across diverse entrepreneurial contexts.

Despite these contributions, several limitations should be acknowledged. The study was conducted within a relatively limited community setting involving a single group of MSME participants and employed a short-term evaluation period immediately following the training intervention. Consequently, the findings primarily reflect short-term competency improvements and may not fully capture the long-term sustainability of behavioral changes, business performance, or digital transformation outcomes. Furthermore, the descriptive evaluation approach did not investigate causal relationships between participant characteristics, learning processes, and business performance, thereby limiting broader generalization across different regional, industrial, and socio-economic contexts.

Future studies are encouraged to adopt longitudinal research designs to evaluate the long-term effects of community-based digital literacy interventions on business growth, financial performance, innovation capacity, and organizational resilience. Comparative studies involving different regions, business sectors, and digital maturity levels would further enrich understanding of contextual factors influencing the effectiveness of community empowerment initiatives. Future research may also incorporate advanced quantitative analyses or mixed-method approaches to explore the relationships among digital literacy, entrepreneurial behavior, technology adoption, and business sustainability. Ultimately, this study contributes to the broader public by providing evidence that community-based digital literacy is not merely an educational intervention but a strategic instrument for promoting inclusive economic development, strengthening local entrepreneurial ecosystems, and enhancing the long-term competitiveness of MSMEs within the digital economy.

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