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BUILDING STRATEGIC ADOPTION IN EVOLVING DIGITAL ECOSYSTEM FOR MSMEs

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ABSTRACT

With over 66 million Micro, Small, and Medium Enterprises (MSMEs), Indonesia relies heavily on this sector, which contributes 61% to the national GDP. However, many MSMEs—especially in regions like Bantul and Yogyakarta—face significant barriers to adopting digital technologies. This study examines how digital literacy training combined with SMART (Specific, Measurable, Achievable, Relevant, Time-bound) strategic planning influences MSME self-efficacy and digital skills. A mixed-method quasi-experimental design involving ten participants from five MSMEs was employed. Quantitative results indicated modest improvements in self-efficacy (2.74%) and digital skills (2.33%), though these were not statistically significant. However, qualitative data revealed enhanced digital confidence, increased awareness of online market potential, and persistent challenges related to strategy execution and technological access.

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INTRODUCTION

As the fourth most populous country in the world, Indonesia is home to over 275 million people, with more than 66 million involved in Micro, Small, and Medium Enterprises (MSMEs). This sector contributes approximately 61% of the national Gross Domestic Product (GDP), accounting for IDR 9,580 trillion (KADIN, 2023). Beyond their macroeconomic significance, MSMEs serve as critical pillars for employment and local economic resilience, especially during periods of uncertainty such as the COVID-19 pandemic (Maryanto et al., 2022).

Aligned with the Making Indonesia 4.0 agenda, digital transformation has become a national priority to enhance MSME competitiveness, expand market access, and improve operational agility. Studies have shown that MSMEs with strong resource capabilities, innovation orientation, and social capital are better positioned to sustain performance and build resilience (Kussudyarsana et al., 2023). However, this transformation remains uneven across regions. For example, while Sleman Regency has more than 1,950 public Wi-Fi hotspots to support digital adoption, Bantul Regency has only six (Bratmantyo, 2024), reflecting a significant infrastructure gap. Coupled with limited technological literacy, such disparities constrain MSME innovation and participation in the digital economy (Pramitha, 2023; Sari, 2019).

Despite these challenges, Bantul's MSME ecosystem shows promising potential. Local government programs like SiBakul Jogja, grassroots entrepreneurship, and community partnerships offer a foundation for inclusive digital development. Nevertheless, persistent barriers—such as low awareness of human capital development, lack of tailored mentoring, and uneven digital readiness—impede MSMEs' strategic progress. Moreover, Agustin and Isa (2025) highlight that adopting digital marketing strategies and stronger customer collaboration can significantly boost MSME competitiveness, reinforcing the need for technical capacity and strategic planning.

This study addresses a key gap in MSME digital transformation: the absence of structured planning approaches that are contextually tailored to infrastructure-constrained regions. While digital infrastructure and government initiatives exist, MSMEs often lack the strategic capacity to implement digital tools effectively. Therefore, this study explores whether combining digital literacy training with SMART-based (Specific, Measurable, Achievable, Relevant, Time-bound) action planning can enhance MSME self-efficacy and digital skills in Bantul.

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The following section reviews relevant literature on digital transformation, entrepreneurial self-efficacy, and structured planning to position this study within the broader research landscape and identify the hypotheses to be tested.

LITERATURE REVIEW

Digital Transformation and MSMEs

Digital transformation has emerged as a key driver of innovation and sustainability for Micro, Small, and Medium Enterprises (MSMEs), especially in resource-constrained environments. It involves the adoption of digital tools and their integration into core business strategies and operations (Legowo et al., 2022). Legowo et al. proposed a conceptual framework for Indonesia's "SME-Go Digital" initiative, highlighting the necessity of aligning technology adoption with dynamic capabilities to drive meaningful change.

Recent studies reinforce this perspective. Purusottama et al. (2022) analyzed how MSMEs adapted their business models in response to pandemic disruptions, emphasizing agility and process flexibility. Noviaristanti et al. (2023) argued that digital tools alone are insufficient without organizational readiness and effective leadership. Bilal et al. (2024) added that technological, organizational, and environmental factors—mediated by employee competencies—shape digital transformation outcomes in developing countries. Farid et al. (2025) confirmed that digital marketing adoption enhances MSME competitiveness through sustainable marketing orientation.

Literacy also plays a key role. Raharjo et al. (2024) found that digital literacy strongly influences transformation, supported by personal traits such as locus of control and social capital. Alyani et al. (2023) identified digital orientation and government support as significant enablers. Sri Hariyanti and Desi Kristanti (2024) presented key obstacles, including infrastructure gaps and digital strategy ambiguity, while Dewi et al. (2025) underscored how literacy advances economic independence, particularly in rural sectors. Meanwhile, Destrian (2024) showed that CEO digital literacy significantly influences transformation outcomes.

Entrepreneurial Competence and Leadership in MSMEs

Entrepreneurial competence and leadership are essential factors enabling MSMEs to navigate change. Prajawati et al. (2024) emphasized the importance of leadership, strategic vision, and relational intelligence for women-led SMEs. Gun et al. (2024) supported the dual role of transformational leadership and self-efficacy in digital initiatives. Purwoko and Hassan

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(2023) demonstrated how innovation leadership improves supply chain efficiency through process innovation.

Karnowati et al. (2023) also linked innovation orientation with improved marketing performance in the culinary MSME sector. Ikhwan and Himawati (2024) further revealed that performance reconfiguration—driven by skill-building and organizational health—supports MSME competitiveness, though the study did not explicitly link this to SMART planning.

Self-Efficacy in Digital Readiness

Bandura (1986) defined self-efficacy as belief in one's ability to execute actions required for specific goals. In MSMEs, this psychological construct is pivotal in technology acceptance and behaviour change. Kutsyuruba and Godden (2019) found mastery, modelling, and reflection can strengthen adult learners' self-efficacy.

Dewi et al. (2025) demonstrated that transformational leadership and digital competence enhance performance mediated by self-efficacy. Malodia et al. (2023) observed that higher self-efficacy levels predict digital adoption in MSMEs, while Lavianti et al. (2025) linked self-efficacy with IT engagement and performance. Syukri and Sunrawali (2022) highlighted the role of mentoring in improving tech confidence, and Ganefri et al. (2024) showed its importance for entrepreneurial intention among students.

However, as Sri Hariyanti and Desi Kristanti (2024) noted, structured interventions to develop self-efficacy remain rare, particularly in digitally underserved areas. Agustin and Isa (2025) reinforced this by showing that digital marketing adoption and customer collaboration foster competitiveness—especially when entrepreneurs are psychologically prepared.

SMART-Based Planning for MSME Development

The SMART framework—Specific, Measurable, Achievable, Relevant, and Time-bound—has become a practical tool for bridging abstract aspirations with actionable plans. In digital adoption, SMART aids in goal articulation, progress monitoring, and motivation (Bonifacio, 2025).

Hartatik et al. (2021) found that MSMEs using SMART principles were more effective in resource allocation and marketing. However, integration of SMART with digital literacy remains under-researched. Morris et al. (2022) stressed the need for adaptive planning frameworks in constrained contexts. Research by Ikhwan and Himawati (2024) echoed this by suggesting that digital and organizational realignment can improve MSME resilience—although SMART itself was not addressed.

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MATERIAL AND METHOD

Research Design

This study employed a quasi-experimental pre-post design with a mixed-method approach to evaluate the impact of digital literacy training and SMART-based strategic planning on MSME actors in Bantul, Yogyakarta. This design was selected because it is suitable for real-world interventions where randomized control is impractical, particularly among small businesses with flexible schedules and community-rooted operations (Shadish et al., 2002). Combining quantitative and qualitative methods enabled a more comprehensive understanding of measurable and experiential outcomes.

Object and Unit of Analysis

The object of this research was the MSME actors operating in Bantul Regency, with units of analysis at the individual level (entrepreneurial self-efficacy) and the organizational level (digital skills and strategic capabilities). Observations focused on business owners and marketing personnel responsible for initiating and managing digital transformation within their enterprises.

Participants and Sampling

Participants consisted of ten individuals from five MSMEs in Kapanewon Kasihan, Bantul. The businesses represented various sectors, including pottery, herbal medicine, food production, woven crafts, and snack industries. Purposive sampling was used, with inclusion criteria based on the diversity of business types and limited access to digital infrastructure. These criteria were established through initial field visits and semi-structured interviews.

Training Needs Analysis

To ensure relevance, a structured Training Needs Analysis (TNA) was conducted using a three-tier framework: organizational, task, and individual. At the organizational level, MSMEs reported restricted internet access and limited marketplace visibility, hindering growth (Mazhischam et al., 2018). At the task level, digital marketing knowledge and tool usage were notably underdeveloped (Noviaristanti et al., 2023). At the individual level, participants expressed psychological reluctance toward technology, rooted in low digital confidence and past failures (Indrayanti et al., 2024; Syukri & Sunrawali, 2022).

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Training Program

The intervention consisted of four structured sessions. The first session built entrepreneurial self-efficacy by helping participants reframe limiting beliefs and adopt an adaptive mindset. The second session focused on digital consumer behaviour and market trends. The third session provided hands-on exposure to digital tools, including platform selection and content creation. The final session guided participants in developing SMART-based strategic plans using SWOT analysis. The training was based on the "Go Digital!" module (Pemberdayaan UMKM melalui Efikasi Diri dan Kerja Tim), officially registered with intellectual property rights (EC00202507098) by the Indonesian Ministry of Law and Human Rights.

Evaluation Framework

The evaluation was conducted using the first three levels of Kirkpatrick's model. At the reaction level, participants provided feedback on the training's relevance and delivery. Self-efficacy and digital literacy changes were assessed at the learning level using pre- and post-tests. At the behavioural level, real-world application of skills and planning tools, such as using SMART frameworks in actual business decisions, was evaluated.

Operational Definition and Measurement of Variables

This study operationalizes entrepreneurial self-efficacy (ESE) as an individual's belief in their ability to perform key entrepreneurial tasks, including identifying opportunities, planning strategically, mobilizing resources, and executing business operations. The construct follows the multidimensional framework proposed by Cox et al. (2002) and further refined by Dinis et al. (2013), underscoring entrepreneurs' psychological readiness to manage uncertainty and sustain business development. To measure ESE, the study employed a ten-item scale developed initially by Kickul et al. (2009) and later adapted into the Indonesian context by Murwani et al. (2017). Items were scored on a five-point Likert scale ranging from 1 (not confident) to 5 (very confident). Subject matter experts reviewed the instrument for content relevance and then pilot-tested on 15 MSME actors in Bantul. The pilot study yielded a Cronbach's alpha of 0.81, indicating satisfactory internal reliability for further use in this population.

Meanwhile, digital skills in this study refer to an individual's capacity to use digital technology effectively, critically, and adaptively for business-related tasks. The definition is based on the digital competence framework adapted by Qoyyimi et al. (2023) , which integrates eight key domains of digital literacy, including information and data literacy, communication and collaboration, content creation, safety, problem-solving, device

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operation, application use, and adaptability to emerging digital tools. These competencies reflect technical ability and the cognitive and behavioural skills needed to function in a digitally driven market. The measurement instrument consisted of 12 items capturing practical digital behaviours such as verifying online information, producing digital content, operating apps and devices, and collaborating via digital platforms. Responses were collected using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The internal consistency reliability of this scale, as measured by Cronbach's alpha, was 0.79, indicating acceptable reliability for research purposes.

Data Collection and Analysis Techniques

The study used a mixed-methods approach. The data come from training participants, collected through surveys and reflective documents, and analyzed using a mixed-methods design combining descriptive comparative and thematic analyses. Quantitative data were collected using pre- and post-intervention surveys and analyzed using descriptive comparative analysis to identify shifts in self-efficacy and digital competencies. Qualitative data from participants' SWOT outputs and SMART plans were subjected to thematic analysis to uncover learning reflections, strategic thinking, and behavioural application patterns. This integrated approach ensured a holistic understanding of the training's cognitive and behavioural impacts.

RESULT AND DISCUSSION

Analysis of Data

This study examined the effects of integrated digital literacy training and SMART strategy implementation on MSMEs' self-efficacy and digital competencies in Bantul, Special Region of Yogyakarta. The results are presented in two parts: a quantitative analysis based on the pre-post measurement and qualitative insights derived from participants' experiences and behavioural change.

Quantitative Results

Table 1. Descriptive Statistics and Pre-Post Change

Variable	Pre-test Mean (SD)	Post-test Mean (SD)	Change (%)
Self-Efficacy	36.5 (6.75)	37.5 (5.98)	2.74%
Digital Literacy	32.25 (6.47)	33.0 (8.00)	2.33%

Source:Author's analysis, 2025

Descriptive statistics indicated modest yet consistent improvements in participants' self-efficacy and digital competencies following the intervention. The mean self-efficacy

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score increased from 36.5 (SD = 6.75) to 37.5 (SD = 5.98), a 2.74% gain, while digital skills rose from 32.25 (SD = 6.47) to 33.0 (SD = 8.00), reflecting a 2.33% improvement. These upward shifts suggest that participants perceived incremental enhancement in their confidence and digital proficiency after completing the training.

However, paired-sample t-test results indicated that these changes were not statistically significant ($p > 0.05$), with small effect sizes (Cohen's $d < 0.25$). This implies that, although the intervention had a positive directional influence, its measurable impact remained limited. The modest gains are plausibly linked to the brief intervention period and small sample size, which constrained statistical power and the consolidation of new behavioral patterns.

Table 2. Paired Sample t-Test Results

Variable	t	p-value	Effect Size
Self-Efficacy	-0.662	0.262	-0.209
Digital Literacy	-0.431	0.338	-0.136

Source:Author's analysis, 2025

Despite the absence of significant differences, the consistent directional trends across both constructs signal the early emergence of learning effects. Such patterns often represent preliminary stages of cognitive and behavioral adjustment that may intensify through repeated exposure or extended practice. The findings therefore point to a latent potential for more substantial improvement under longer-term or more intensive training conditions.

Qualitative Insights

Qualitative data were drawn from SWOT analyses and participant reflections, highlighting changes in awareness, confidence, and digital business practices. Four major themes were identified: strengths, opportunities, weaknesses, and threats.

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Figure 1. Community Service Location

Source: Authors (2025)

Participants reported increased confidence in using digital platforms, particularly social media, for business promotion. For example, one noted, *"I became more confident in applying digital marketing strategies to my business."* In the opportunities domain, MSMEs began to recognize untapped digital markets. One shared, *"I now use social media more strategically to attract new customers."*

However, some weaknesses persisted, particularly in autonomous strategy applications. One participant admitted, *"I still struggle with utilizing all features of social media effectively."* Infrastructure limitations, such as outdated devices or slow internet, were also cited as significant threats: *"My devices cannot support marketplace operations properly."*

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Figure 2. Training Session

Source: Authors (2025)

Table 3. Key Themes and Illustrative Quotes from Qualitative Analysis

Theme	Summary Insight	Participant Quote
Self-Confidence Enhancement	Increased confidence in using digital platforms for promotion.	*"I became more confident to be able to apply digital marketing strategies to my business."*
Measurable Strategy	Increased clarity in planning and goal setting using SMART strategies.	*"Trying to increase the collection of samples to be displayed in the marketplace…"*
Social Media Optimization	More consistent use of social media for customer outreach.	*"Now I try to regularly post on social media for promotion."*
Operational Support	Mentoring provided ongoing support to overcome initial challenges.	*"The mentoring with my mentor helped me overcome obstacles when I started implementing the plans…"*

Source:Author's analysis, 2025

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These insights reflect a positive shift in participants' understanding and application of digital tools and planning strategies. The program fostered technical knowledge and behavioural changes, including more consistent social media use, clearer strategic goal-setting, and initiating digital business activities. These results demonstrate alignment with Level 3 of Kirkpatrick's evaluation model, indicating that knowledge and skills gained were transferred into practical business behaviours.

Kirkpatrick Level 3 evaluation confirmed that participants began applying SMART planning and digital skills in their daily operations, reflecting successful behavioural transfer.

Figure 3. Group Photo Session with the mentors

Source: Authors (2025)

Discussion

The findings of this study provide important implications for enhancing MSME readiness in adopting digital technology through structured and context-sensitive training. Although the quantitative gains in self-efficacy and digital skills were modest, they indicate that targeted training can stimulate positive changes, especially when accompanied by mentoring support and follow-up activities.

These results align with Bandura (1986) theory of self-efficacy, which highlights the role of confidence in shaping behaviour. When participants feel more capable—such as practising digital promotion or using structured planning—they are more likely to implement what they have learned. The observed increase in confidence and planning behaviour supports this theory and reinforces the value of combining digital skill development with motivational strategies.

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Furthermore, this study strengthens existing literature, suggesting that structured approaches like SMART planning can help MSMEs operate more effectively in uncertain environments (Hartatik et al., 2021; Williams et al., 2018). Clear goals give direction and reduce ambiguity, which is critical for small business owners managing limited resources.

The experience of MSMEs in Bantul also reflects findings from Bhuiyan et al. (2024), who observed that businesses adopting digital transformation reports increased operational efficiency and innovation—but only when paired with human resource support. In this study, mentoring was found to be crucial in overcoming initial hesitation and operational barriers.
In addition to self-efficacy and strategy, participants' behaviour was shaped by environmental factors such as internet access, device availability, and perceived customer readiness—echoing the multi-factor influence identified by Romero and Mammadov (2024) and Bilal et al. (2024). These contextual challenges should inform future training designs so interventions remain realistic and impactful.

This research's contribution lies in offering a structured, evidence-based training model that integrates technical skills, planning, and mentoring for MSMEs in digitally underserved areas. This model can serve as a practical reference for designing scalable digital empowerment programs for policymakers and training providers, especially as Indonesia advances toward its "Go Digital" and SDG 9 agendas.

The results confirm that when integrated with goal-setting strategies such as SMART, structured digital literacy training can foster initial improvements in psychological and technical readiness among MSMEs. While statistical significance was not reached, directional improvements and qualitative findings indicate meaningful mindset and strategic behaviour shifts. The modest effect sizes are not uncommon in pilot studies with small samples. However, they suggest the potential for scale-up with more extended intervention periods and intensive follow-up.

These findings support Bandura's (1986) theory of self-efficacy, wherein belief in personal ability enhances motivation and adaptability. Structured interventions that provide mastery experiences and reinforcement—such as SMART planning—can trigger proactive behaviours. As seen in this study, MSMEs improved their confidence and ability to formulate and implement targeted business strategies.

It aligns with the findings by Hartatik et al. (2021), who showed that structured goal-setting boosts MSME responsiveness to market challenges. Similarly, Bhuiyan et al. (2024) emphasized that willingness to embrace digital innovation is a key characteristic of successful entrepreneurs, especially in constrained environments. Adaptation capacity is also influenced

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by personal and environmental variables such as cognitive ability (Aruni & Hidayat, 2019), innovation competence (Shao et al., 2025), and resilience (Ibrahim & Sumaryono, 2019). Furthermore, Merieska and Meiyanto (2019) emphasize that entrepreneurial persistence is strongly shaped by passion, environmental feedback, and adaptive behavioral tendencies—factors that play a critical role in sustaining digital transformation efforts among MSMEs. Furthermore, the application of SMART strategies in this study supports (Williams et al., 2018) assertion that goal clarity improves execution, particularly in resource-limited settings—the ability to set realistic, measurable goals provides structure and motivation for MSMEs navigating digital transformation.

Integrating digital literacy with strategic planning—supported by mentoring—offers a comprehensive framework for building MSME digital readiness. This model contributes to broader efforts in sustainable entrepreneurship and aligns with national goals for inclusive digital transformation in Indonesia.

CONCLUSION AND RECOMMENDATION

This study concludes that the integration of digital literacy training and SMART-based strategic planning can enhance self-efficacy and digital competencies among MSME actors in Bantul, Yogyakarta. While the improvements observed—2.74% in self-efficacy and 2.33% in digital literacy—were not statistically significant, they demonstrate encouraging trends in building foundational readiness for digital adaptation. The training successfully promoted strategic awareness, structured goal-setting, and improved confidence in navigating digital platforms despite infrastructural limitations.

Implementing the SMART framework was especially effective in helping participants translate their knowledge into actionable business strategies. Mentoring was key in reinforcing behaviour change, enabling MSMEs to overcome hesitation and initiate consistent digital marketing practices.

Suggestions and Practical Contributions

MSME actors are encouraged to continue applying their digital marketing knowledge through active use of digital platforms, accompanied by regular performance monitoring and goal refinement. Practising SMART-based planning can help maintain strategic clarity and guide decision-making in dynamic market environments. Training providers, especially those working with small businesses in underserved areas, are advised to replicate this integrated model, which combines technical training, goal-setting, and mentoring. Such a combination has been shown to promote knowledge acquisition and behavioural change. Additionally,

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government institutions and policymakers should support replicating and scaling context-sensitive digital empowerment programs in regions facing infrastructure challenges. Doing so will accelerate Indonesia's digital economy agenda and contribute to national goals for inclusive innovation and equitable growth. This research contributes practically by offering an adaptable training model for MSME digital readiness and strategically supports inclusive economic development. It aligns with Sustainable Development Goals, particularly SDG 8 on Decent Work and SDG 9 on Industry, Innovation, and Infrastructure.

Limitations and Future Research

This study has several limitations. First, the small sample size (five MSMEs, ten participants) limits the generalizability of the findings. Second, the short post-training observation window did not capture long-term behavioural outcomes. Third, the inclusion of mentoring may have introduced facilitator bias, making it difficult to isolate the effect of training alone.

Future research should consider longitudinal designs and larger, more diverse samples to assess long-term impacts. Comparative studies with and without mentoring components can help isolate the mechanisms behind effective digital adaptation. Finally, examining the interaction between digital training, leadership dynamics, and organizational culture would offer more profound insights into scalable MSME development strategies.

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