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Empowering Sidoarjo MSMEs through AI-Driven Content Creation and Smart Content Studio Training

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Abstract:

Digital marketing communication among micro, small, and medium enterprises (MSMEs) requires coordination of product visuals, persuasive writing, and practical content-production methods. Many MSME owners, however, face constraints in equipment access and digital editing skills. This community service study examined an intervention in Sidoarjo, East Java, that combined hands-on smartphone product photography and AI-assisted copywriting with an integrated appropriate-technology package centered on the Smart Content Studio. The package included shared production equipment, content and studio kits, instructional modules, and product-styling props. Evaluation combined qualitative observations and interviews with a 15-item pretest and posttest completed by 12 matched participants. Activities addressed natural window lighting, product composition, and conversational, storytelling-based captions. Participant-level assessment results showed varied patterns of change. The reported pillar-level analysis indicated greater gains in basic product photography and copywriting and social media marketing than in composition and visual editing. The findings describe changes in test performance and observed practices; they do not by themselves establish effects on sales or long-term business outcomes. The program offers a practical model that combines skills training, AI-assisted drafting, and shared physical infrastructure, while further evidence is needed on sustained application and business results.

Keywords: *digital marketing communication, MSME empowerment, smartphone product Photography, AI-assisted copywriting, Smart Content Studio, community service*

Introduction

Micro, Small, and Medium Enterprises (MSMEs) form a substantial part of Indonesia's national economy. Official reports indicate that MSMEs contribute more than 60% of Gross Domestic Product (GDP) and absorb a large share of the workforce (Kementerian Koordinator Bidang Perekonomian Republik Indonesia, 2022). In East Java's creative economy sector, micro-scale enterprises in local food processing, crafts, and heritage-based goods provide important livelihoods for rural and semi-urban communities. Post-pandemic digital acceleration has increased pressure on these businesses to use e-commerce and social media marketing channels (Munifah et al., 2024). Access to mobile internet is relatively high, yet many local entrepreneurs still lack practical content-production skills. This gap can limit organic reach and the quality of promotional materials (Saputri et al., 2023).

Women play a prominent role in this landscape. Data from the Ministry of Trade indicate that a substantial proportion of Indonesia's MSMEs are managed or owned by women (Kementerian Perdagangan Republik Indonesia, 2025). At the same time, surveys point to gaps in digital and financial literacy between women and men, and relatively limited use of e-commerce platforms among women-owned MSMEs (Pranitasari et al.,

2025; Prajuliyanto, 2025). Women-led micro-enterprises often rely on localized offline marketing and may lack structured skills in digital content management, visual presentation, and promotional writing (Wiyarti, 2025; Wilujeng et al., 2024).

Similar constraints appear in other Indonesian community-service programs. El Chidtian, Arifianto, and Megasari (2025a) documented branding and visual-identity weaknesses among Omah Batik Nusantara MSMEs. Wulandari, Bagaskara, and Febrianita (2025) reported promotional and branding limitations among MSMEs in Kedung Baruk and provided assistance in packaging design and social-media content. El Chidtian, Romadhona, and Febrianita (2025b) described a digital-transformation program for UMKM Nusantria in Wonosalam that combined digital-marketing training with content-production equipment. Development communication can support local economic initiatives by facilitating stakeholder engagement, community participation, and the integration of local products into broader development strategies. Achmad et al. (2025) illustrated this role through a qualitative study of batik tourism development in Arjowinangun Village, where collaboration among local stakeholders contributed to the positioning of batik tulis as an educational tourism attraction and supported the development of the local creative economy. These studies illustrate recurring needs for visual consistency, practical content skills, and stakeholder-oriented communication; they do not imply that the Sidoarjo participants faced identical conditions, nor do they evaluate AI-assisted content production or shared studio facilities.

Social media marketing capability is multidimensional, and its relationship with business performance varies across capability dimensions and performance indicators. In a study of 364 business entrepreneurs in Thailand, Tarsakoo and Charoensukmongkol (2020) found that social media product development and marketing implementation capabilities were positively associated with both customer relationship performance and financial performance, whereas communication and planning capabilities were associated with different performance dimensions. These findings provide a rationale for examining digital marketing practices in MSME development programs, but they do not establish that content-creation training alone improves business performance.

Against this background, the 2026 community service program in Sidoarjo was designed to address two interconnected practical problems: limitations in visual product presentation and a predominantly informational style of promotional writing. The intervention combined hands-on smartphone photography, conversational copywriting supported by generative AI as a drafting aid, and the installation of a shared appropriate-technology facility called the Smart Content Studio. The studio provided shared lighting, backdrops, props, and instructional modules so that participants could practice under more controlled conditions than those available in many home settings. The program aligns with national priorities on digital transformation of MSMEs and with broader goals related to decent work and accessible innovation infrastructure.

This article reports the design, implementation, and evaluation of the program. Evaluation combined qualitative observations and interviews with a paired pretest-posttest cognitive assessment of 12 matched participants. The article presents participant-level and pillar-level results, discusses observed practices around photography, editing, and copywriting, and notes the limits of the available evidence regarding business outcomes.

Method

This community service project was carried out in Sidoarjo, East Java, with 17 selected MSME participants in coordination with the Department of Cooperatives and MSMEs of East Java Province. The physical hub and appropriate-technology installation were located at a coworking space in Sidoarjo, chosen for regional accessibility. The implementation team consisted of faculty members specializing in digital media management, promotional communication, and multimedia design, supported by student

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assistants who facilitated peer coaching. The program used an experiential learning approach, allocating approximately 30% of the curriculum to conceptual explanation and 70% to hands-on practice at the studio.

The project proceeded through four operational phases. First, a needs assessment used structured interviews to identify hardware and cognitive gaps. Second, two intensive training sessions were held on 25 May and 29 June 2026, covering digital branding mindset, smartphone product photography, and generative AI for copywriting. Third, the Smart Content Studio was installed; the equipment package absorbed half of the internal funding (Rp10,000,000 of Rp20,000,000). Fourth, continuous mentoring and evaluation were conducted through weekly content clinics.

Cognitive development was evaluated with a pre-experimental paired pretest-posttest design. A 15-item multiple-choice questionnaire was administered before and after the training. Items were grouped into three competence pillars: Basic Product Photography (Items 1-5), Visual Composition and Editing (Items 6-12), and Copywriting and Social Media Marketing (Items 13-15). All 17 assisted MSMEs received training and studio access. Twelve participants completed both the pretest and the posttest and formed the matched analytic sample; five additional posttest respondents were excluded from paired analysis because baseline records were unavailable. Mastery categories were defined as Low Mastery (0-50%), Medium Mastery (51-70%), and High Mastery (71-100%). Qualitative data from observations and interviews supplemented the score patterns and provided context for individual variation.

Result and Discussion

Baseline Conditions and Needs Assessment

The baseline assessment identified two interconnected challenges among participating MSMEs: limitations in visual product presentation and a predominantly informational approach to promotional writing. The central issue was not simply whether participants used social media, but whether they could produce product content that was visually clear and communicatively purposeful. Although participants had access to smartphones, this access did not consistently translate into effective product-photography practices or more developed promotional messages.

One constraint concerned participants' perceptions of the equipment required for commercial-quality photographs. During the needs assessment, several participants expressed the view that good product photographs required expensive DSLR cameras or professional studios. Such perceptions can create a perceived resource barrier. A practical example recorded in the assessment was a banana-chip producer who photographed products in a dimly lit living room with a 5-watt bulb, producing dark images with visible visual noise. This example illustrates local production challenges related to lighting and the use of available resources; it should not be generalized to every participating MSME without further evidence.

A second challenge appeared in promotional writing. Review of sample posts showed captions that mainly presented product information rather than developing a more distinctive promotional message. Informational captions can communicate basic details, but the observed pattern suggested that participants could benefit from a broader range of writing approaches, including conversational and story-based options adapted to their products and audiences.

These local findings are consistent with patterns reported in other Indonesian MSME assistance programs, while remaining specific to the Sidoarjo context. Prior programs have addressed branding weaknesses, inconsistent visual identity, and limited digital-marketing practices through combinations of training and production equipment (El Chidtian, Arifianto, & Megasari, 2025a; Wulandari et al., 2025; El Chidtian, Romadhona, & Febrianita, 2025b). Related work on development communication further indicates that stakeholder engagement and coordinated communication can support local

creative-economy initiatives (Achmad et al., 2025). That study examined batik tourism development in Arjowinangun and does not evaluate content-production training, AI-assisted drafting, or shared studio facilities; it is cited here only as adjacent context for the role of communication in local economic empowerment. The Sidoarjo intervention therefore focused on guided practice with accessible tools-smartphone photography under natural light, conversational caption writing supported by AI drafting aids, and a shared studio facility-rather than on conceptual explanation alone.

Training and Cognitive Growth Analysis

The training translated the identified needs into guided practical activities. In Pillar 1 (Basic Product Photography), participants practiced using their smartphones and positioning products near natural window light. In Pillar 3 (Copywriting), the Anti-Kanebo Kering module introduced conversational copywriting and storytelling-based captions. These activities emphasized hands-on production rather than exclusive reliance on verbal explanation. The cognitive assessment captures changes in participants' responses to the test questions; it should not be treated as a direct measure of the quality of the photographs or captions they produced.

Table 1 presents the paired pretest and posttest scores for the 12 matched participants. The mean cognitive score rose from 69.99% (approximately 70.0%) before training to 78.25% after training, an increase of about 8.3 percentage points. Individual patterns varied. Linda Carolina de Fretes (Gado-Gado Bunda) moved from 40.0% to 60.0%, leaving the Low Mastery category. Mira Oktini (AIM STORE) recorded the largest gain, from 53.3% to 100.0%. Two participants showed lower posttest scores: Evi Silvia Anggraeni (73.3% to 60.0%) and Sufi Susanti (66.7% to 60.0%). In a small-sample, single-group design, such declines can reflect multiple factors-including assessment conditions, fatigue after intensive practical sessions, or item-level difficulty-and do not by themselves establish that learning failed to occur. Interviews provided complementary accounts of possible fatigue and time pressure during testing; these accounts remain interpretive rather than conclusive.

Table 1. Paired Pretest and Posttest Cognitive Performance of Sidoarjo MSMEs (N = 12)

No.	Participant Name	MSME Name	Pretest Score	Posttest Score
1	Evi Silvia Anggraeni	Chef Masfud Kitchen	73.3%	60.0%
2	Ary Maratus Sholichah	Nasi Pecel Bu Bin	60.0%	66.7%
3	Sufi Susanti	PEARL'S COOKIES	66.7%	60.0%
4	Linda Carolina de Fretes	Gado-Gado Bunda	40.0%	60.0%
5	Anita Permanasari	Toko Hijau NOER	80.0%	86.7%
6	Alicia Stephanie Carlene	ASC Store	100.0%	100.0%
7	Setyawati Pawontia	Pawontia	73.3%	73.3%
8	Siti Mariatun Najmiyah	Sachiko Store	53.3%	79.0%
9	Nani Widyaningsih	D'Lova Bakery	80.0%	86.7%
10	Mira Oktini	AIM STORE	53.3%	100.0%
11	Restya Mochtar	MINI SUMOZ	93.3%	93.3%
12	Trio Yuli Antari	YY SHOP	66.7%	73.3%
	Mean		**69.99% (~70.0%)**	**78.25%**

Note. Scores are percentages of correct responses on the 15-item instrument. The matched sample comprises the 12 participants with both pretest and posttest records.

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The results indicate positive aggregate cognitive change alongside heterogeneous individual outcomes. The rise in the mean score describes the general direction of the paired results; it does not imply that every participant improved on every competency. The individual records and interview accounts supply complementary perspectives: the scores describe changes in test performance, while the interviews offer possible explanations for selected results. Neither form of evidence, by itself, establishes that participants subsequently produced more effective marketing content or achieved better business outcomes.

Pillar-Specific Results and Visual Editing Challenges

Table 2 reports mean pretest and posttest scores by competence pillar. Basic Product Photography rose from 70.00% to 80.00% (+10.00 percentage points). Copywriting and Social Media rose from 75.00% to 83.35% (+8.35 percentage points). Composition and Visual Editing rose from 67.83% to 75.00% (+7.14 percentage points) and showed the smallest gain among the three pillars. These figures describe differences in test performance; they do not establish why progress varied across pillars.

Table 2. Mean Cognitive Scores by Competence Pillar (N = 12)

Competence pillar (items)	Average pretest	Average posttest	Change (pp)
Pillar 1: Basic Product Photography (Q1-Q5)	70.00%	80.00%	+10.00
Pillar 2: Composition and Visual Editing (Q6-Q12)	67.83%	75.00%	+7.14
Pillar 3: Copywriting and Social Media (Q13-Q15)	75.00%	83.35%	+8.35

One plausible interpretation concerns the sequential demands of mobile visual editing. Participants must coordinate several operations within an application-cropping, color adjustment, text overlay, and export. Cognitive load theory emphasizes the importance of considering the demands that learning tasks place on human cognitive processing when designing instruction (Sweller, 2011). In practical training, tasks that require learners to coordinate multiple operations may benefit from structured demonstrations, guided practice, and opportunities for independent repetition. In the present program, this perspective may help frame the sequential demands of mobile visual editing as a possible explanation for the observed performance pattern. However, because cognitive load was not directly measured, this interpretation should be treated as a hypothesis rather than an established explanation. Future sessions could break editing tasks into shorter stages, demonstrate each step, allow guided repetition, and ask participants to reproduce the workflow independently. Such adjustments would need systematic evaluation to determine whether they improve performance and transfer beyond the supported training environment.

Age-related and attitudinal factors toward technology have been examined in other literatures (Hauk et al., 2018; Vroman et al., 2015). Those studies provide contextual perspectives on technology acceptance but do not directly explain the Sidoarjo results; neither establishes that age or technology anxiety affected the participants in this intervention.

Copywriting Development and Conversational Promotional Writing

The reported result for Pillar 3 increased from 75.00% to 83.35% (+8.35 percentage points). This pattern indicates improvement on the assessment items related to copywriting and social media. The result should be interpreted within the scope of the assessment: it reflects responses to the administered questions and does not by itself demonstrate that participants consistently changed their promotional writing or that their businesses subsequently gained more customers or sales.

Social media marketing capability is multidimensional, and prior research has shown that its association with business performance varies by capability dimension and performance indicator (Tarsakoo & Charoensukmongkol, 2020). That study, based on data from entrepreneurs in Thailand, provides a rationale for examining digital marketing practices in MSME programs. It does not, however, establish that content-creation training-whether AI-assisted or otherwise-improves business performance. The present program focused on photography, caption writing, and basic editing; it did not measure customer relationship performance, financial performance, or other business outcomes.
Before the training, some promotional messages were described by the program team as formal and distant from everyday customer communication. The copywriting module introduced conversational wording and short, relatable stories. The aim was to help participants move beyond listing product features and consider how a caption could explain the product's use, relevance, or appeal. This was a practical training approach developed for the program, not a formal copywriting framework tested by the study.

A promotional caption must do more than sound friendly. It should communicate accurate product information, make the offer clear, and use wording suitable for its intended audience. A short story or relatable situation may supply context, but its usefulness depends on the product, audience, platform, and clarity of the actual offer. The training therefore presented conversational and story-based writing as options that participants could adapt, rather than as a formula expected to work for every business.

Generative AI was used to prepare initial message templates that participants could adapt to their products and preferred style of communication. In this process, AI functioned as a drafting aid; participants remained responsible for checking factual accuracy and deciding whether the wording represented their business appropriately. A grammatically fluent draft may still be generic, include inapplicable details, or sound unlike the business owner. The relevant learning task was therefore not only to generate copy quickly, but also to review, correct, and personalize it before publication. The available assessment does not independently measure the accuracy of AI-generated text or the quality of participants' subsequent revisions.

Integration of Physical Appropriate Technology: Smart Content Studio

The Smart Content Studio was installed as a shared production facility intended to address the practical constraints observed in home settings. The package included lighting equipment, backdrops, product-styling props, instructional modules, and basic content kits. Approximately half of the program's internal funding was allocated to this physical infrastructure. The facility provided a more controlled environment for practicing the photography and composition techniques introduced in training.

Observations during studio sessions indicated that participants shared props, exchanged feedback on product placement, and assisted one another with lighting setup. These interactions suggest that the shared space created opportunities for peer support in addition to equipment access. The study did not, however, isolate the effect of the studio on image quality, editing workload, independent reproduction of the workflow, or sales. These remain intended mechanisms and questions for further evaluation rather than demonstrated outcomes.

Table 3 summarizes the standard operating procedure (SOP) used in the studio. The workflow prioritizes accessible steps that can be performed with smartphones and the shared equipment, reducing reliance on specialized technical knowledge.

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Table 3. Standard Operating Procedure Matrix for the Smart Content Studio

Stage	Action	Purpose
1. Setup	Position product near natural window light or studio softbox; select plain backdrop	Control lighting and reduce background distraction
2. Composition	Apply simple framing (rule of thirds or centered); adjust height and angle	Improve visual clarity and product focus
3. Capture	Use smartphone camera; take multiple shots under consistent light	Obtain usable raw images without specialized cameras
4. Basic edit	Crop, adjust brightness/contrast, remove minor distractions on phone	Prepare image for social-media format
5. Caption	Draft conversational or story-based text; review and personalize AI suggestions	Align message with product and audience

Overall, the intervention combined skills training, AI-assisted drafting, and shared physical infrastructure. Understanding of basic photographic principles and promotional-writing concepts appeared more responsive to the training than mastery of the procedural and spatial demands of mobile editing. The findings should be interpreted cautiously: the evaluation used a single-group pretest-posttest design, included 12 matched participants, and lacked a comparison group. The assessment did not include a standardized rubric for actual photographs or captions, and complete comparable sales and engagement data were unavailable.

Taken as a whole, the Sidoarjo program operationalized the three elements named in its design-AI-assisted content drafting, smartphone-based product photography, and the Smart Content Studio-within a single community-service package. The cognitive assessment indicated aggregate improvement and differentiated gains across pillars, while qualitative observations documented peer support and practical engagement during studio sessions. These results speak primarily to changes in test performance and to observed practices under facilitated conditions. They do not demonstrate that participants became independently proficient content producers, that digital participation gaps were closed, or that business outcomes improved. Claims of empowerment or digital inclusivity would require additional evidence on sustained skill use, independent workflow reproduction, and measurable changes in market access or sales.

For future restatements, three priorities follow from the present findings. First, evaluation should move beyond multiple-choice cognitive scores to include rubric-based appraisal of photographs and captions produced before and after training, as well as documentation of whether participants can complete the full production workflow without facilitation. Second, studio utilization should be logged systematically so that equipment access can be linked to practice frequency and content output. Third, a modest set of engagement or sales indicators should be collected over a defined follow-up period, with clear acknowledgment of attribution limits in the absence of a comparison group. Until such evidence is available, the program is best characterized as a practical model that integrates skills training, AI-assisted drafting, and shared production infrastructure, rather than as a demonstrated pathway to digital inclusivity or business growth.

Conclusion

The 2026 Sidoarjo community service program combined hands-on smartphone product photography, conversational copywriting supported by generative AI as a drafting aid, and a shared Smart Content Studio. Among the 12 matched participants, the mean cognitive score rose from approximately 70.0% to 78.25%. Gains were larger in basic product photography and in copywriting and social media marketing than in

composition and visual editing. Individual trajectories varied, and two participants recorded lower posttest scores. Qualitative observations indicated peer support within the studio and practical engagement with lighting and caption tasks.

These results describe changes in test performance and observed practices under the conditions of the program. They do not establish that the intervention increased sales, audience engagement, or long-term business performance. Future evaluations should assess content produced before and after training with explicit rubrics, test whether participants can repeat the workflow without assistance, document studio utilization, and track engagement and sales indicators over a defined period. The program offers a practical model that integrates skills training, AI-assisted drafting, and shared production infrastructure; further evidence is required to determine whether these supports produce sustained changes in content-production practice and business outcomes.

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