

Training On The Utilization of Artificial Intelligence For Optimizing MSME Product Marketing On E-Commerce Platforms

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Abstract.

This community service activity aimed to strengthen the capacity of micro, small, and medium enterprises (MSMEs) in Karanganyar Regency to utilize artificial intelligence (AI) for product marketing on e-commerce platforms. Thirty MSME representatives participated in training covering four competency domains: AI concept understanding, AI tool use, marketing content creation, and e-commerce product optimization. Learning outcomes were evaluated descriptively using pre-test and post-test mean scores on a 0–100 scale. The results showed improvement in all four domains. AI concept understanding increased from 50 to 80, equivalent to a 30-point gain and a 60.0% relative improvement. AI tool use increased from 55 to 70 (27.3%), marketing content creation from 50 to 82 (64.0%), and e-commerce product optimization from 53 to 81 (52.8%). Across the four indicators, the average score increased from 52.00 to 78.25, representing an absolute gain of 26.25 points and a 50.5% relative improvement. The highest post-test score and the largest relative improvement were observed in marketing content creation, while AI tool use showed the smallest relative gain. These descriptive findings indicate positive immediate learning outcomes and support the use of practice-oriented AI training to strengthen MSME digital marketing capabilities. Because only aggregate pre-test and post-test means were available, the results should not be interpreted as evidence of statistical significance or long-term business performance. Follow-up mentoring and outcome monitoring are recommended.

Keywords: artificial intelligence; MSMEs; e-commerce; digital marketing; community service and training.

I. INTRODUCTION

Digital platforms have expanded market access for micro, small, and medium enterprises (MSMEs), but effective participation in e-commerce requires capabilities beyond simply opening an online store. Product titles, descriptions, promotional messages, visual communication, and consistent digital content affect how products are discovered and evaluated by prospective customers. Digital marketing strategy and e-commerce adoption are therefore increasingly connected to SME market positioning and marketing performance [1], [2].

Artificial intelligence offers practical opportunities to support these activities. AI applications can assist marketers in generating and refining promotional text, organizing information, adapting messages, analyzing alternatives, and personalizing content [3]. Generative AI is particularly relevant to SMEs because it can support routine knowledge work and creativity with relatively low technical barriers, although effective implementation still depends on employee competence, managerial judgment, organizational readiness, and responsible oversight [4], [5], [6].

For micro-entrepreneurs, the challenge is not only access to AI tools but also the ability to translate them into concrete marketing practices. Jatmika, Ratnasari, and Nadlifatin [7] highlight the need for AI-based marketing approaches that are understandable and applicable to micro-enterprise contexts. At a broader level, the OECD D4SME survey shows that SME digitalisation can help firms navigate short-term challenges and strengthen long-term resilience [8]. Recent community service activities in digital marketing similarly show the value of participatory training and direct practice for developing practical digital capabilities, while also emphasizing that short-term pre-test and post-test results should be distinguished from longer-term business outcomes [9].

Based on this need, the community service activity reported in this article involved 30 MSME representatives in Karanganyar Regency. The training focused on four competencies directly related to e-commerce marketing: AI concept understanding, AI tool use, marketing content creation, and e-commerce product optimization. The objective was to strengthen participants' immediate knowledge and practical readiness to use AI as an assistive tool in digital marketing. The contribution of the activity lies in a compact

training framework that connects basic AI literacy with marketing tasks and evaluates immediate learning through comparable pre-test and post-test indicators.

II. METHODS

The community service activity involved 30 MSME representatives from Karanganyar Regency. The training and evaluation were organized around the same four competency domains used in the assessment: AI concept understanding, AI tool use, marketing content creation, and e-commerce product optimization. This alignment was intended to ensure that the evaluated outcomes corresponded directly to the material delivered during the activity.

The implementation sequence consisted of an initial pre-test, delivery of the four training domains, practical application of the material, and a post-test. The conceptual component introduced the role and potential uses of AI in marketing. The practical component focused on using AI tools to support marketing-related tasks, developing promotional content, and improving the presentation of products on e-commerce platforms. The activity emphasized AI as an assistive technology that requires human review and contextual adaptation rather than as an automatic replacement for business judgment [5], [6].

Learning outcomes were evaluated using mean pre-test and post-test scores on a 0–100 scale. For each indicator, absolute gain was calculated as the post-test mean minus the pre-test mean. Relative improvement was calculated using: $\text{Improvement (\%)} = ((\text{Post-test mean} - \text{Pre-test mean}) / \text{Pre-test mean}) \times 100$. The analysis was descriptive. Inferential testing was not performed because participant-level paired scores, standard deviations, and score distributions were not available in the aggregated dataset. Consequently, this article reports immediate learning changes and does not claim statistical significance or causal effects on business performance.

Table 1. Training domains and evaluation focus

Training domain	Main focus	Evaluation indicator
AI concept understanding	Basic concepts, opportunities, limitations, and appropriate use of AI in marketing	Understanding of AI concepts
AI tool use	Application of AI tools to support marketing-related tasks	Ability to use AI tools
Marketing content creation	Development and refinement of product descriptions and promotional content	Marketing content creation
E-commerce product optimization	Improvement of product presentation and marketing information on e-commerce platforms	Product optimization capability

III. RESULT AND DISCUSSION

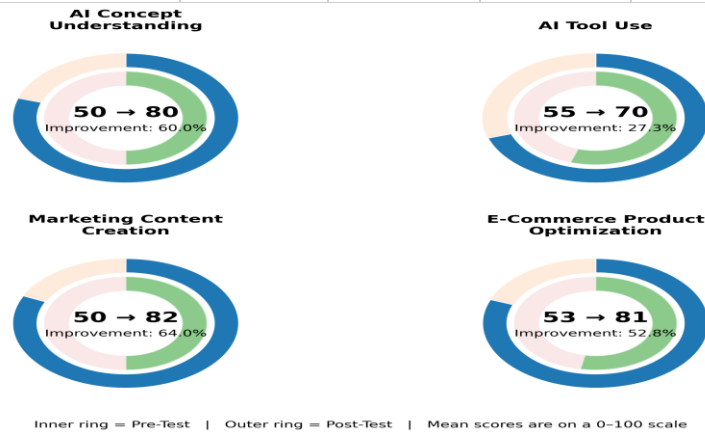
The descriptive evaluation showed improvement across all four competency domains. Pre-test means ranged from 50 to 55, whereas post-test means ranged from 70 to 82. The average across the four indicators increased from 52.00 before the training to 78.25 after the training. Table 2 summarizes the score changes, while Figure 1 presents the same outcomes in a circular format that distinguishes pre-test and post-test values.

AI concept understanding increased from 50 to 80, producing a 30-point absolute gain and a 60.0% relative improvement. The change suggests that the training supported a stronger immediate understanding of AI and its relevance to marketing activities. Conceptual literacy is an important foundation for adoption because users need to identify appropriate use cases and understand that AI-generated outputs still require evaluation and contextual judgment [4], [5].

AI tool use increased from 55 to 70, equivalent to a 15-point gain and a 27.3% relative improvement. Although the direction of change was positive, this domain recorded the smallest relative improvement and the lowest post-test mean. One plausible interpretation is that operational proficiency requires repeated practice beyond initial exposure. Systematic evidence on AI adoption in SMEs identifies knowledge, infrastructure, and implementation capability as recurring barriers, suggesting that follow-up mentoring may be particularly useful for converting initial familiarity into confident routine use [4].

Table 2. Descriptive pre-test and post-test outcomes

Indicator	Pre-Test	Post-Test	Gain	Improvement (%)
AI concept understanding	50	80	30	60.0
AI tool use	55	70	15	27.3
Marketing content creation	50	82	32	64.0
E-commerce product optimization	53	81	28	52.8
Average	52.00	78.25	26.25	50.5

**Fig. 1. Circular diagram of pre-test and post-test results of 30 MSME participants**

Marketing content creation increased from 50 to 82, representing a 32-point gain and the largest relative improvement at 64.0%. This domain also achieved the highest post-test mean. The result is consistent with the practical accessibility of generative AI for content ideation, drafting, message adaptation, and personalization [3], [6]. For MSMEs with limited time and marketing resources, content creation can therefore serve as an accessible entry point for AI-assisted digital marketing, provided that final outputs are reviewed for factual accuracy, brand consistency, and suitability for the intended audience.

E-commerce product optimization increased from 53 to 81, corresponding to a 28-point gain and a 52.8% relative improvement. This pattern indicates that participants were able to connect AI use with the presentation of products on e-commerce platforms rather than using AI only for general text generation. The result is relevant because digital marketing strategy and e-commerce adoption are associated with SME marketing performance when they are integrated with broader organizational capabilities [1], [2].

Across all four domains, the average score increased by 26.25 points, from 52.00 to 78.25, which corresponds to a 50.5% relative improvement. The overall pattern supports the practical value of a structured, task-oriented training approach. It also resembles recent community service findings showing that participatory digital marketing training can improve immediate knowledge and skills when participants work directly with relevant marketing tasks [9]. However, the present results should be interpreted as short-term descriptive learning outcomes rather than evidence of sustained business impact.

The evaluation has several limitations. First, only aggregate mean scores were available, preventing paired-sample statistical testing and analysis of variation among the 30 participants. Second, the post-test captured immediate learning after the activity and did not measure retention over time. Third, business indicators such as e-commerce traffic, conversion rate, customer engagement, sales growth, content productivity, and repeat purchase were not included. Future community service programs should combine participant-level pre-test and post-test data with follow-up mentoring and longitudinal business indicators to assess whether improved AI capability is translated into sustained marketing performance.

IV. CONCLUSION

The AI training activity for 30 MSMEs in Karanganyar Regency produced positive descriptive learning outcomes across all four evaluated domains. AI concept understanding increased from 50 to 80, AI tool use from 55 to 70, marketing content creation from 50 to 82, and e-commerce product optimization from 53 to 81. The average score across the four indicators increased from 52.00 to 78.25. Marketing content creation recorded both the highest post-test score and the largest relative improvement, while AI tool use showed the smallest relative gain. These findings indicate that practice-oriented AI training can strengthen immediate digital marketing knowledge and skills among MSMEs, particularly in content creation and product optimization. Further mentoring and participant-level follow-up evaluation are recommended to assess skill retention and longer-term effects on e-commerce marketing performance.

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