

## Bridging the digital gap: Impact of digital marketing training on women-led MSMEs in Klaten

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### Abstract

Digital inequality continues to limit women entrepreneurs in rural and semi-urban areas from fully participating in the digital economy. Strengthening digital marketing literacy is essential to improve their business competitiveness and market access. This study aimed to evaluate the effectiveness of a digital marketing training in improving the digital marketing literacy of women-led micro, small, and medium enterprises (MSMEs) in Klaten, Central Java. A one-group pretest-posttest pre-experimental design was employed with 35 participants selected through purposive sampling. The training intervention was delivered in a one-day session and measured through two key indicators: understanding of digital marketing concepts and responsible use of social media. Each indicator consisted of Likert-scale questions administered before and after the training. The results showed a clear improvement in participants' knowledge and skills across both indicators, with higher mean scores recorded after the training. These findings suggest that even short-format, context-driven digital training can enhance both conceptual and ethical digital marketing literacy among women entrepreneurs.

Keywords: Digital Marketing, Digital Literacy, Women MSMEs, Training Effectiveness, Social Media

### Abstrak

Kesenjangan digital masih menjadi hambatan utama bagi pelaku UMKM perempuan di daerah pedesaan dan semi-perkotaan dalam memanfaatkan peluang ekonomi digital secara optimal. Peningkatan literasi digital marketing menjadi kunci untuk memperkuat daya saing dan akses pasar usaha mereka. Penelitian ini bertujuan untuk mengevaluasi efektivitas pelatihan digital marketing dalam meningkatkan literasi digital marketing pelaku Usaha Mikro, Kecil, dan Menengah (UMKM) perempuan di Kabupaten Klaten, Jawa Tengah. Desain penelitian yang digunakan adalah pra-eksperimen *one-group pretest-posttest* dengan melibatkan 35 partisipan yang dipilih melalui teknik *purposive sampling*. Intervensi pelatihan dilakukan dalam satu sesi selama satu hari dan diukur melalui dua indikator utama: pemahaman konsep digital marketing dan penggunaan media sosial secara bijak. Masing-masing indikator terdiri dari pertanyaan dengan skala Likert yang diberikan sebelum dan sesudah pelatihan. Hasil penelitian menunjukkan adanya peningkatan yang jelas pada pengetahuan dan keterampilan peserta di kedua indikator, dengan skor rata-rata yang lebih tinggi setelah pelatihan. Temuan ini menunjukkan bahwa pelatihan pemasaran digital yang singkat namun kontekstual dapat meningkatkan literasi pemasaran digital secara konseptual maupun etis di kalangan pelaku UMKM perempuan.

Kata kunci: Pemasaran Digital, Literasi Digital, UMKM Perempuan, Efektivitas Pelatihan, Media Sosial

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## 1. Introduction

In the increasingly digital era, women-led micro, small, and medium enterprises (MSMEs) in developing regions face a significant digital divide, which hampers their access to digital marketplaces, utilization of e-commerce, and implementation of effective digital marketing strategies (Widiawati et al., 2022). This divide is especially visible in regions like Klaten, Central Java, where socio-economic conditions, uneven digital infrastructure, and low digital literacy levels create barriers to growth. According to Indonesia's 2022 national digital literacy index, the average score was 3.54 out of 5, classified as "moderate," highlighting a gap between awareness of technology and effective usage (Mastercard Center for Inclusive Growth, 2024).

Women-managed MSMEs play a crucial role in local economies, particularly in household and micro-enterprise sectors. However, many still lack the skills to select and use appropriate digital tools for their businesses, and they rarely receive contextualized and user-friendly training (Mastercard Center for Inclusive Growth, 2024). The situation in Klaten reflects broader national challenges, where rural and semi-urban entrepreneurs often face compounded barriers due to limited training resources, infrastructure gaps, and socio-cultural norms that restrict women's access to digital skills development (OECD, 2023). As such, digital marketing training is increasingly seen as a strategic approach to enhance digital competence, marketing performance, and market competitiveness.

Empirical evidence from various Indonesian case studies supports the importance of such training interventions. In Surabaya, training for female MSME operators in Rusunawa Wonorejo significantly improved their abilities to use WhatsApp Business, Instagram, and Google Business Profile, enhancing customer engagement (Lindiauwati et al., 2023). Likewise, female entrepreneurs within the 'Aisiyiah community in Bandung demonstrated improved promotional skills and strategic social media usage post-training (Arissaputra & Sentika, 2023). In rural Lampung, structured digital marketing strategy training led to increased revenue and expanded reach for women-led MSMEs (Dermawan et al., 2020). Similar patterns are evident internationally, such as in rural India, where women entrepreneurs who underwent targeted digital marketing programs reported 35% revenue growth and improved brand visibility within six months (Bhagat et al., 2021).

More broadly, a quantitative study in West Java indicated that digital literacy and access to organizational resources significantly impact MSME performance, mediated by digital innovation (Zahwa et al., 2025). This aligns with findings from Rajapolah, Tasikmalaya now replaced with a systematic review by Oktavianti & Soetjipto (2025) demonstrating that digital literacy is a critical predictor of marketing performance via capabilities in digital adoption, sustainable strategies, and ecosystem support (Oktavianti & Soetjipto, 2025). Moreover, global research highlights that women-focused digital skills training contributes not only to business performance but also to broader socio-economic empowerment. Collectively, these studies imply that structured,

community-based training, supplemented by follow-up support, substantially enhances digital competence among women entrepreneurs.

Despite these insights, pre-post test evaluation designs remain underutilized in Indonesia, with most studies relying on descriptive or qualitative methods rather than quantifiable measurement of knowledge and skill improvements. A community-based blended learning model implemented in Palembang showed notable gains in digital literacy among female MSMEs, yet lacked robust quantitative evaluation using pre- and post-test data (Helmi et al., 2025). Internationally, pre-experimental designs have been used effectively to assess training impacts in contexts with similar socio-economic barriers, underscoring their suitability for community empowerment research (Alessandri et al., 2017). Therefore, a more rigorous study design is needed to accurately assess the direct impact of such interventions on participants' digital competencies and business performance.

This study aims to address this gap by implementing a digital marketing training program for women MSME owners in Klaten, followed by pre-test and post-test evaluations. Effectiveness is measured using two key indicators: understanding of digital marketing concepts, and responsible use of social media. Through this approach, the research quantifies changes in these domains and evaluates the program's contribution to knowledge and skill enhancement at each indicator. Additionally, the study explores the potential scalability of this training model as a female-focused empowerment initiative applicable to similar micro-entrepreneur contexts in other regions. The findings from this research are expected to provide empirical evidence on the short-term effectiveness of targeted, context-driven digital marketing training, offer a replicable framework for community-based capacity building programs, and inform policymakers and development agencies on strategies to bridge the gender digital divide in rural and semi-urban settings.

## **2. Literature Review**

### **Women's Digital Literacy**

The digital divide between men and women, commonly referred to as the gender digital divide, has become an increasingly significant issue in today's digital era, especially in developing countries like Indonesia. This divide refers to disparities in access, usage, and the benefits gained from digital technology between male and female populations. In the context of women-led MSMEs, this gap is often exacerbated by limited digital literacy, unequal access to devices and networks, and prevailing socio-cultural norms that restrict women's active participation in digital spaces (UNICEF, 2023). As a result, women entrepreneurs in rural or semi-urban regions such as Klaten are more likely to be left behind in leveraging technology as a driver of business growth.

As the demand for digital adaptation increases, digital literacy has emerged as a key factor in narrowing this divide. Digital literacy encompasses not only technical skills in using digital tools but also an understanding of digital marketing concepts, social media use, and awareness of online ethics and safety (Widiawati et al., 2022). Previous studies show that structured digital literacy training can improve self-confidence,

adaptability, and the effectiveness of marketing communication among women MSME owners. For example, training programs in various regions have significantly enhanced participants' ability to use platforms such as WhatsApp Business and Instagram for promotion and business communication (Arissaputra & Sentika, 2023; Lindiawati et al., 2023).

Beyond technical skill development, digital literacy also contributes to business resilience and competitiveness. Study of MSMEs in Southwest Papua, found that digital marketing literacy had a positive impact on entrepreneurial orientation and business sustainability. This finding highlights that women entrepreneurs with a strong grasp of digital marketing concepts tend to be more adaptive to market changes, particularly in the post-pandemic landscape (Rachmadana et al., 2024). Digital literacy also enables MSMEs to reach broader markets, reduce promotional costs, and strengthen customer relationships through digital engagement.

Furthermore, digital literacy has been proven to be a significant predictor of MSME marketing performance. A systematic review revealed that digital literacy skills consistently influence MSME performance in Indonesia through the effective use of digital platforms such as e-commerce and social media for sustainable business development (Oktavianti & Soetjipto, 2025). This is supported by a study by Umboh & Aryanto (2023) which demonstrated that digital literacy served as a mediating variable in the relationship between digital marketing strategy and business performance specifically among natural batik MSMEs in Bayat, Klaten. In this context, digital literacy not only enhances operational capabilities but also builds confidence in addressing digital challenges and mitigates cybersecurity risks.

### **Digital Marketing Training for Women-led MSMEs**

The development of digital literacy among women-led MSMEs must be embedded within a comprehensive framework that integrates knowledge transfer with empowerment strategies. Strategic models highlight digital literacy, access to organizational resources, and innovation capacity as key drivers of business performance (Zahwa et al., 2025). Within this framework, digital marketing serves as a crucial component, combining technological skills with market-oriented strategies to improve visibility, customer engagement, and sales performance.

Digital marketing training has been shown to be more effective when combined with technical mentoring, strengthened business networks, and a supportive social environment. Community-based learning approaches, as demonstrated by Helmi et al. (2025) in Palembang, significantly enhanced digital marketing skills among female MSME participants through mentor–mentee relationships, experiential learning, and community support. This model is especially relevant in Klaten, where local culture and social cohesion play a significant role in the success of empowerment initiatives.

Local evidence further supports the effectiveness of targeted digital marketing interventions. A study in Nglinggi Village, Klaten, by Yuliatiningtyas et al., (2024) demonstrated that well-structured digital marketing training improved women's capacity to use social media wisely and strategically, leading to expanded market

reach and strengthened household economic independence. These findings suggest that digital marketing programs not only improve business outcomes but also contribute to broader social empowerment and gender equity in entrepreneurship.

### 3. Research Method

This study employs a quantitative approach using a pre-experimental one-group pretest-posttest design, aimed at evaluating the effectiveness of digital marketing training in improving the digital literacy of women-owned MSMEs. This design allows researchers to measure changes in participants' knowledge and skills before and after the training intervention without involving a control group. Such a design has been widely used in competency-based training studies to assess short-term knowledge gains directly (Cooksey & Jonsson, 2022). This research was developed as a practical method that integrates five digital literacy indicators into a single, structured intervention, making it replicable in other MSME empowerment contexts.

The study was conducted in Klaten Regency, Central Java, involving 35 women MSME entrepreneurs selected through purposive sampling. The inclusion criteria included: women who had recently started a micro or small business, owned a digital device such as a smartphone, and were willing to participate in the entire training program. The research design adopted was a one-group pretest-posttest pre-experimental design, which allowed the measurement of changes in participants' knowledge and skills before and after the training intervention. The training session was delivered in a full-day face-to-face classroom format lasting approximately seven hours, combining lectures, demonstrations, and guided practice to ensure comprehension and skill application. This design has been widely used in training evaluation research due to its ability to directly measure short-term learning outcomes in a controlled training setting.

Data collection was carried out using a Likert-scale questionnaire covering two key indicators: (1) understanding of digital marketing concepts, and (2) responsible use of social media, with each indicator consisting of 2–3 items. Pretest and posttest scores were analyzed descriptively to identify mean score changes and percentage improvements for each indicator. To statistically test whether there were significant differences between pretest and posttest scores, the Wilcoxon Signed-Rank Test was employed, as the data did not meet the normality assumption. The hypotheses tested were:

$$H_0: \text{median of the two populations is equal } [P(+)] = P(-)$$

$$H_1: \text{median of the two populations is different } [P(+)] \neq P(-)$$

with a significance level of  $\alpha=0.05$ . The test statistic  $z_T$  was calculated using the following formula:

$$z_T = \frac{T - \mu_T}{\sigma_T}$$

Where the mean rank sum ( $\mu_T$ ) and standard deviation ( $\sigma_T$ ) were calculated as:

$$\mu_T = \frac{n(n+1)}{4}$$

$$\sigma_T = \sqrt{\frac{n(n+1)(2n+1)}{24}}$$

The null hypothesis was rejected if the p-value  $\leq 0.05$ , indicating a statistically significant difference between pretest and posttest scores. This analytical procedure is consistent with established practices in non-parametric paired data analysis for training effectiveness evaluations.

The results of this analysis were used to assess how effective the digital marketing training was in enhancing participants' digital literacy. This approach aligns with digital training evaluation models that emphasize measuring direct knowledge gains as indicators of training effectiveness (Karabaczek & Horváth, 2025). With a systematic, measurable, and indicator-based methodology, this study is expected to contribute to the development of an efficient and replicable intervention model for empowering women MSMEs.

## 4. Results and Discussion

### 4.1. Results

Descriptive analysis was conducted to understand the demographic characteristics of the training participants, consisting of 35 female MSME (Micro, Small, and Medium Enterprises) owners in Klaten Regency. The variables analyzed included age, highest level of education, employment status, and household income range. Most respondents were in the age groups of 46–55 years and  $\geq 56$  years, with educational backgrounds predominantly from high school and higher education. The majority of participants were also housewives. The detailed distribution of respondents' characteristics is presented in Table 1.

Table 1. Demographic Characteristics of Female MSME Participants

Characteristic	Category	Frequency	Percentage (%)
Age	36–45 years	7	20.0
	46–55 years	16	45.7
	$\geq 56$ years	12	34.3
Highest Education Level	Primary School	1	2.9
	Junior High School	3	8.6
	Senior High School	15	42.9
	Diploma/Bachelor/ Master Degree	16	45.7
Employment Status	Employed	11	31.4
	Housewife	24	68.6
Household Income	< IDR 2,000,000	10	28.6
	IDR 2,000,000 – 5,000,000	18	51.4
	IDR 5,000,000 – 10,000,000	6	17.1
	> IDR 10,000,000	1	2.9



The effectiveness of the digital marketing training was evaluated through the measurement of pretest and posttest scores based on two digital marketing literacy indicators: understanding of digital marketing concepts and responsible use of social media. Scores were collected using a Likert-scale questionnaire and analyzed descriptively to obtain the mean, score range, and standard deviation. The analysis results indicated an increase in the average scores for both indicators following the training intervention, as presented in Table 2.

Table 2. Descriptive Statistics of Pre-test and Post-test Score

Indicator	N	Min	Max	Mean	Std. Dev.
Pre-test					
Understanding of digital marketing concepts	35	3	15	9.34	2.72
Responsible use of social media	35	7	15	11.29	2.15
Post-test					
Understanding of digital marketing concepts	35	8	15	12.51	1.62
Responsible use of social media	35	9	15	13.23	1.70

The descriptive analysis of pretest and posttest scores indicates an improvement in participants' digital literacy across both measured indicators: understanding of digital marketing concepts and responsible use of social media. For the first indicator, the average pretest score was 9.34 with a standard deviation of 2.72, reflecting a wide variation in initial understanding among participants. After the training, the mean score increased to 12.51 with a reduced standard deviation of 1.62, suggesting not only a substantial improvement in comprehension but also a more consistent level of understanding across the group. This result indicates that the training effectively conveyed core digital marketing concepts in a manner that was accessible to most participants.

For the second indicator, related to the responsible use of social media, the mean pretest score was 11.29 with a standard deviation of 2.15, which rose to 13.23 post-training, accompanied by a slightly lower standard deviation of 1.70. This increase demonstrates a strengthened awareness of ethical digital behavior, including privacy, professionalism, and respectful communication in online spaces. The decrease in standard deviation for both indicators also shows that the training succeeded in harmonizing participants' knowledge levels. Overall, the findings provide strong evidence that a one-day digital marketing training session can effectively enhance fundamental digital literacy competencies among female MSME owners, particularly in understanding marketing principles and practicing responsible social media engagement.

Inferential analysis was conducted to examine the effectiveness of digital marketing training in improving participants' digital literacy. Due to the non-normal distribution of the data, the Wilcoxon Signed-Rank Test was used to compare pretest and posttest scores across the two main indicators. The results of this analysis are presented in Table 3.

Table 3. Results of Wilcoxon Signed-Rank Test on Pretest and Posttest Digital Marketing Literacy Scores

Digital Marketing Indicators	N	Z	Asymp. Sig. (2-tailed)
Understanding of Digital Marketing Concepts	35	-4.879	0.000
Responsible Use of Social Media	35	-3.901	0.000

The Wilcoxon Signed-Rank Test results indicate a statistically significant difference between pretest and posttest scores for both indicators of digital marketing literacy. Participants showed measurable improvement in their understanding of digital marketing concepts and their ability to use social media responsibly following the training intervention. These findings suggest that the training was effective in enhancing core aspects of digital marketing literacy among female MSME participants.

## 4.2. Discussion

### Demographic Characteristics of Women MSME Participants

Understanding the demographic profile of participants is essential in analyzing the relevance, receptivity, and impact of digital marketing training among female MSMEs. Table 1 shows that a substantial proportion of participants were in mid-to-late adulthood, indicating that women entrepreneurs in this age ranges remain actively engaged in micro-enterprises, particularly in rural or semi-urban contexts like Klaten. While this demonstrates entrepreneurial resilience, it also suggests the persistence of age-related digital gaps, as older adults often report lower digital confidence and higher technological anxiety compared to younger cohorts (Valli, 2025).

Educational attainment within the group suggests relatively strong digital readiness, with many participants having completed formal education at the secondary or tertiary level. This indicates the potential for quicker adaptation to new digital tools, as higher educational backgrounds have been associated with greater digital engagement among women (Valli, 2025). This is notably higher than the national average for rural female entrepreneurs, suggesting that participants might represent a more motivated and literate subgroup of local MSMEs (Al Waroi et al., 2025). Education strongly correlates with digital adaptability, and higher levels of formal education have been associated with increased digital engagement among women (Valli, 2025).

In terms of employment status, a majority identified as housewives who also manage home-based micro-businesses. It reflects the dual role many women play in managing households while participating in income-generating activities, often through informal or home-based micro-businesses. This duality may affect time allocation and access to formal business training. However, empowering housewives through flexible digital training models could be a strategic tool to foster inclusive economic development (Wicaksono et al., 2025).

Income levels among participants point to modest household resources, often characteristic of subsistence or lower-middle-income MSMEs. Limited financial capacity may constrain investment in advanced technologies, yet it also positions digital marketing as an accessible, cost-effective solution for market expansion. These



figures suggest that most MSME owners in this cohort operate at a subsistence or lower-middle-income level. The affordability and scalability of digital platforms offer these entrepreneurs a path to increase visibility and revenue without requiring large capital (Zukari & Aryanto, 2025).

The demographic profile of female MSME owners in this study reflects a population that is mature, modestly educated, predominantly engaged in home-based economic activities, and operating with limited financial resources. These characteristics underline the importance of delivering digital marketing interventions that are context-sensitive, user-friendly, and immediately applicable. It also suggests that well-designed training can act as a catalyst not only for skill development but also for broader gender-inclusive economic participation.

### **Impact of Digital Marketing Training on Digital Marketing Literacy**

The results presented in Tables 2 and 3 indicate a clear improvement in participants' digital marketing literacy following the training intervention. Both key indicators understanding of digital marketing concepts and responsible use of social media showed notable enhancement from before to after the training. This reflects participants' increased comprehension, practical awareness, and engagement with digital tools after just a single day of structured learning. These gains align with previous findings showing that even short-format interventions can strengthen digital competencies when designed with locally relevant examples and accessible delivery methods (Mohamad et al., 2025). The improvement in understanding of digital marketing concepts is particularly significant, as this competency forms the foundation for MSMEs seeking to transition from traditional to online-based operations (K et al., 2025). With stronger conceptual knowledge, women entrepreneurs are better equipped to choose suitable digital platforms, craft messages that resonate with customers, and monitor their marketing performance effectively.

Similarly, the growth in responsible use of social media underscores the importance of ethical and strategic engagement in online spaces. Beyond simply having a digital presence, responsible use ensures that entrepreneurs maintain professionalism, safeguard privacy, and curate content that fosters customer trust factors that are essential for sustainable brand development (Szwajca & Rydzewska, 2025). This multidimensional approach to digital marketing literacy combining technical proficiency with ethical responsibility reflects the evolving demands of digital entrepreneurship. In contexts where women entrepreneurs often represent family-based businesses, these skills have both economic and reputational value (Zukari & Aryanto, 2025). The findings demonstrate that even limited-duration interventions, when strategically designed and community-specific, can lead to meaningful gains in digital marketing literacy. The training's significant impact as captured by the Wilcoxon test further substantiates its value as a replicable model for empowering rural and semi-urban women entrepreneurs across Indonesia.

## 5. Conclusion

This study confirms that targeted digital marketing training significantly enhances digital marketing literacy among women MSME entrepreneurs in Klaten. The findings demonstrate measurable improvements in participants' understanding of digital marketing concepts and their responsible use of social media, as shown by the increase in posttest scores and validated by the Wilcoxon signed-rank test. The results provide a new perspective on the feasibility and effectiveness of short-duration, community-based digital upskilling programs, especially when grounded in local needs and structured around core literacy indicators. This suggests that even limited interventions, when well-designed, can produce substantial knowledge gains and behavioral changes. The study contributes to the growing evidence that digital literacy must go beyond technical skills to include strategic and ethical dimensions offering a more holistic model of empowerment for women-led microenterprises. This approach can serve as a replicable framework for broader digital inclusion efforts in similar socio-economic settings.

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