



Participatory Community Action

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STRENGTHENING LILY BATIK JEPARA'S MSME COMPETITIVENESS THROUGH PRODUCTION AND DIGITAL MARKETING STANDARDIZATION

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ABSTRACT

Objective: This community service program aims to improve the competitiveness of Lily Batik Khas Jepara SMEs through production quality enhancement and digital marketing optimization. The program focuses on addressing two main issues: inconsistency in batik dyeing quality and the limited utilization of digital marketing platforms for product promotion and market expansion.

Design & Methods: The program was implemented using a Participatory Action Learning (PAL) approach, involving active participation of the SME owner and workers throughout all stages, including problem identification, training, hands-on practice, mentoring, and evaluation. The activities were conducted from February to April 2026 and covered dyeing standardization training, quality control development, SOP preparation for production, digital marketing training, social media optimization (Instagram and Facebook Business), content creation, and marketplace utilization.

Result: The results show an improvement in participants' skills in standardizing the batik dyeing process, leading to more consistent color quality and better product control. In addition, the SME successfully implemented digital marketing strategies by actively managing business social media accounts, producing structured promotional content, and developing a digital product catalog. These improvements enhanced market reach, customer engagement, and overall business performance, contributing to the sustainability and competitiveness of Lily Batik Khas Jepara in the digital era.

Keywords: Batik SMEs, Digital marketing, Production standardization, Participatory Action Learning, Community empowerment.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) are a key pillar of the Indonesian economy, generating employment and contributing significantly to economic activity across regions (Purnomo et al., 2024; Sinha et al., 2024). Digital transformation, including the strategic use of technology for marketing and business management, is increasingly a key lever for expanding MSME market access and strengthening competitiveness (Affandi et al., 2024; Yani et al., 2025).

One of the MSME sectors with significant potential in Indonesia is the batik industry. As a globally recognized cultural heritage, batik holds not only cultural but also significant economic value (Rahmawati & Panjaitan, 2025; Vibriyanto et al., 2025). The batik industry is spread across various regions and serves as a source of livelihood for many businesses, from home-based artisans to larger industries (Suprayitno et al., 2025). This industry contributes to job creation and regional economic growth through culture-based production, trade, and tourism activities.

The development of the batik industry currently faces increasingly complex challenges, such as competition from modern textile products, changing consumer trends, fluctuating raw material prices, and marketing demands increasingly shifting toward digital platforms (Mansur et al., 2023; Razali et al., 2021). Amidst increasingly fierce competition, consumers consider not only product quality but also ease of access to information and transactions, most of which are conducted digitally. Therefore, batik entrepreneurs need to improve their product innovation

capabilities and utilize digital technology to maintain their existence, increase competitiveness, and expand market share both nationally and internationally (Sanggarwati & Hayati, 2025).

Jepara Regency is one of the regions with the potential to develop culture-based creative industries, including the batik industry. Jepara batik has distinctive characteristics that distinguish it from other regions, particularly through motifs inspired by Jepara carving, flora, fauna, and local cultural richness. This uniqueness provides added value that can increase product competitiveness in national and international markets. However, most batik MSMEs in Jepara still face various obstacles, particularly in aspects of digital marketing, brand strengthening, and expanding marketing networks. Many business actors still rely on conventional marketing, resulting in relatively limited market reach. This condition indicates that strengthening digital capacity is a crucial need for batik MSMEs in Jepara to be able to capitalize on broader market opportunities and improve their business sustainability in the digital economy era.

Lily Batik Khas Jepara is a small and medium enterprise (SME) engaged in the production and marketing of hand-drawn batik, specializing in distinctive Jepara motifs, high-quality products, and the ability to fulfill custom orders tailored to customer needs. With the advancement of information technology and changes in consumer behavior, digital marketing has become a crucial factor in determining business competitiveness and sustainability. Consumers now seek product information not only through physical stores but also through various digital platforms such as social media, marketplaces, and search engines (Khasanah et al., 2023; Sharma et al., 2024). Therefore, the ability of MSMEs to utilize digital technology is a necessity that cannot be ignored.

Based on observations and discussions with the owner of the Lily Batik Khas Jepara MSME, the main problem currently faced is in the production aspect, specifically in maintaining the consistency of the batik dyeing quality. The dyeing process is still done manually, so the resulting color results in each production process often experience differences in intensity and color uniformity. This inconsistency is influenced by various factors, such as differences in dye composition, color mixing techniques, weather conditions during the drying process, and the lack of standard operating procedures (SOPs) in the dyeing process. This condition results in the quality of the resulting product being less than completely uniform, potentially affecting customer satisfaction, especially for large orders that require the same color on each product.

Limited production quality control capabilities also mean that product quality evaluation processes are not yet systematically conducted. Consequently, potential product defects due to color differences are often only discovered after production is complete (Kalilah et al., 2026; Sutanto et al., 2025). This issue presents a significant challenge because color quality is a key factor in determining the aesthetic value and competitiveness of batik products in the market. Therefore, efforts are needed to increase production capacity through training in more standardized dyeing techniques and implementing quality control to produce more consistent and high-quality products.

In addition to production issues, the Lily Batik Khas Jepara MSME also faces challenges in digital marketing. Although it utilizes social media as a promotional tool, its marketing activities are still not systematically planned. Uploaded promotional content is still limited and has not been able to build a strong brand identity among consumers. Furthermore, business features on digital platforms such as Instagram Business and Facebook Business have not been optimally utilized, resulting in relatively limited marketing reach (Hanifa et al., 2021). This condition results in the wider market potential being unable to be fully utilized to increase sales and strengthen business competitiveness. Furthermore, digital marketing activities are not supported by a structured digital marketing strategy, so promotional activities are still incidental and not oriented towards reaching a specific target market (Sofian et al., 2024). Furthermore, uploaded promotional content is still limited to simple product information and does not utilize content marketing techniques that can attract attention, increase customer interaction, and build a strong brand image in the digital environment.

Another issue faced is the suboptimal utilization of business features on Instagram and Facebook, such as Instagram Business, Facebook Business Suite, insight features, digital product catalogs, and paid promotion features that can be used to reach a wider market. This condition causes the business's digital marketing potential to be underutilized to increase product visibility and expand customer networks. Therefore, a digital marketing mentoring and training program is needed that focuses on developing digital marketing strategies, developing attractive promotional content, and optimizing the use of social media platforms to improve the competitiveness and marketing performance of the Lily Batik Khas Jepara MSME.

Prior community service and applied research on batik MSMEs have generally addressed production quality and digital marketing capacity as separate concerns: studies such as Kalilah et al. (2026) and Sutanto et al. (2025) focus on statistical quality control and defect reduction in batik dyeing, while others focus on digital marketing adoption without a production quality component. Few interventions have combined both dimensions within a single, partner-driven program. This program addresses that gap by treating production standardization and digital marketing optimization as complementary components of one Participatory Action Learning intervention, tailored specifically to the dyeing inconsistencies and marketing constraints identified at Lily Batik Khas Jepara, and thereby offers an integrated model that other batik MSMEs facing similar dual constraints may adapt.

METHODS

Community service activities at the Lily Batik Khas Jepara MSME were carried out for three months, from February to April 2026. The method used was Participatory Action Learning (PAL), an empowerment approach that places partners as the main subjects in the learning and problem-solving process. Through this approach, partners not only receive training materials but are also actively involved in identifying business problems, formulating solutions, implementing programs, and evaluating the results achieved (Chakraborty et al., 2020). The PAL approach was chosen because the problems faced by the Lily Batik Khas Jepara MSME require not only knowledge transfer but also behavioral changes and capacity building in sustainable business management.

During the problem identification stage, the community service team and partners conducted observations and in-depth discussions regarding business conditions, particularly regarding consistent batik dyeing and digital marketing. Partners were involved in identifying challenges, communicating business needs, and prioritizing issues to be addressed. The results of this identification were then used to develop training materials and mentoring programs to ensure that the activities implemented truly align with the actual needs of the businesses.

In the action learning phase, participants receive training through a combination of lectures, discussions, demonstrations, and hands-on practice (Effendi & Rokhayani, 2025). In terms of production, the material provided includes an introduction to the characteristics of batik raw materials, color mixing and formulation techniques, standardization of the dyeing process, color fixation techniques for greater colorfastness, and product quality control. Participants also receive guidance in identifying the causes of color inconsistencies and hands-on practice in applying more standardized dyeing techniques to produce uniform product quality.

In terms of digital marketing, the material provided covers basic digital marketing concepts, developing digital marketing strategies, managing Instagram Business and Facebook Business accounts, optimizing WhatsApp Business, product photography techniques using smartphones, creating engaging promotional content, writing marketing copywriting, utilizing hashtags and social media insight features, and managing marketplaces. Participants are also trained to create digital product catalogs, create content calendars, and understand strategies for building customer interactions through digital media (Mulyo & Pambudi, 2025).

Following the presentation, participants directly practiced creating a business account, uploading product photos, composing compelling product descriptions, creating visual-based promotional content, and managing product showcases on marketplaces. This hands-on approach enabled participants to gain real-world experience, enabling them to immediately apply the knowledge gained to their daily business activities. This enabled participants to not only understand theoretical concepts but also develop technical skills that can be used to improve product quality and expand the marketing reach of the Lily Batik Khas Jepara MSME.

Table 1. Urgency of Activities in Achieving Community Service Goals

Problems Identified	Proposed Solutions	Methods	Success Indicators
Inconsistent batik dyeing results lead to variations in product quality across production batches.	Improve production capacity through training on dyeing standardization and quality control procedures.	Training, demonstrations, hands-on practice, and mentoring on the development of dyeing SOPs.	Participants are able to implement dyeing SOPs, resulting in more consistent color quality and reduced dyeing errors.
The enterprise lacks standardized operating procedures (SOPs) for batik production.	Develop and implement production SOPs to improve efficiency and product quality.	Workshops, group discussions, SOP development assistance, and implementation monitoring.	Production SOPs are developed and consistently applied in daily production activities.
The business does not have a structured digital marketing strategy to expand its market reach.	Provide training on digital marketing strategy development using social media and online marketplaces.	Lectures, discussions, case studies, and mentoring on strategy implementation.	The enterprise develops a digital marketing plan and is able to implement it independently.
Social media promotional content is limited and lacks attractiveness.	Provide training on content creation, product photography, and marketing copywriting.	Training sessions, content creation workshops, simulations, and mentoring.	A digital product catalog is developed, and promotional content is regularly published on social media platforms.
Instagram Business and Facebook Business features are not utilized effectively.	Assist in optimizing business accounts and leveraging digital platform features for promotion and customer engagement.	Hands-on practice, mentoring on business tools, and monitoring of account activities.	Instagram Business and Facebook Business accounts are actively managed and professionally showcase products and business information.

Problems Identified	Proposed Solutions	Methods	Success Indicators
Market reach remains limited to local customers and conventional sales channels.	Expand digital marketing channels through social media and online marketplaces.	Training, marketplace mentoring, and evaluation of digital marketing performance.	Additional digital sales channels are established, customer engagement increases, and market reach expands.
Human resources have limited skills in managing digital business activities.	Enhance digital business competencies through training and continuous mentoring.	Training, coaching, mentoring, and competency evaluation.	Participants demonstrate improved abilities in managing digital promotion, online marketplaces, and customer communication independently.

The mentoring phase is carried out intensively throughout the program. The community service team assists partners in implementing established coloring standards, developing digital marketing content, managing their business's social media accounts, and evaluating the effectiveness of their promotional strategies. This ensures that partners not only understand the concepts presented but also receive guidance in overcoming various obstacles that arise during the implementation process.

During the evaluation phase, the community service team and partners jointly assess the changes that occurred after the program was implemented. The evaluation is conducted by comparing pre- and post-program conditions, such as improvements in product color consistency, the amount of promotional content produced, their social media activity, and the partners' ability to manage digital marketing independently. The evaluation results are used as the basis for developing recommendations and strategies for future business development, ensuring the program's benefits are sustainable and have a broader impact on the Lily Batik Khas Jepara MSME.

RESULT

The problem identification stage was conducted in February 2026 through field observations, interviews, and focused discussions with the owner and employees of Lily Batik Khas Jepara. This activity aimed to obtain a comprehensive understanding of the business conditions, production processes, and marketing practices currently implemented by the enterprise. The identification process involved direct observation of batik production activities, evaluation of product quality, assessment of marketing channels, and analysis of digital technology utilization in business operations (Ismanto et al., 2025).

The results revealed that the primary challenge faced by the enterprise was related to the production process, particularly the inconsistency of batik dyeing results. Variations in color intensity and uniformity were frequently found between production batches due to differences in dye composition, manual coloring techniques, and the absence of standardized operating procedures (SOPs) for the dyeing process. As a consequence, maintaining consistent product quality remained difficult, especially when fulfilling large-volume orders that required uniform color standards. Furthermore, quality control procedures had not yet been implemented systematically, making it difficult to identify and prevent production defects during the manufacturing process.

In addition to production issues, the assessment identified several challenges in digital marketing activities. Although the enterprise had utilized social media platforms such as Instagram for promotion, marketing efforts were still conducted in an unstructured manner without a clear digital marketing strategy. Promotional content was limited, posting activities were inconsistent, and business features available on Instagram and Facebook had not been fully utilized. The enterprise also had limited experience in managing online marketplaces, digital catalogs, and customer engagement through digital channels. As a result, the market reach remained largely confined to local customers and traditional sales networks.

Based on these findings, it was agreed that the community service program would focus on two main areas: improving production quality through dyeing standardization and quality control practices, and strengthening digital business capabilities through digital marketing training, branding development, social media optimization, and marketplace management. These interventions were expected to enhance product competitiveness, expand market access, and support the long-term sustainability of Lily Batik Khas Jepara.

Action learning activities in the production aspect were conducted through training and hands-on practice, covering an introduction to the characteristics of batik raw materials, color mixing and formulation techniques, dyeing process standardization, color fixation techniques for increased colorfastness, and product quality control. The activity was attended by the owner and employees of the Lily Batik Khas Jepara MSME with the aim of improving the quality and consistency of batik production.

The results of the activity demonstrated an increased understanding of the participants regarding the characteristics of various types of fabrics, dyes, and their impact on the quality of the dyeing results. The activity began with a presentation on the characteristics of raw materials used in the batik production process, specifically the various types of fabrics that have varying color absorption capacities. Participants were given explanations on selecting appropriate fabrics, the types of dyes commonly used in the batik industry, and the factors that influence

the success of the dyeing process. During the session, participants were also given the opportunity to discuss challenges they have faced in producing consistent colors for each product.

Following the presentation, the activity continued with a demonstration of color mixing and formulation techniques. The resource person demonstrated how to determine the composition of dye materials, use simple measuring tools, and the correct mixing procedures to produce colors that meet the desired standards. Next, participants engaged in hands-on practice by mixing several colors and comparing the results. At this stage, participants learned how differences in material composition, mixing time, and color application techniques can affect the final batik dyeing results.

The next stage focused on practicing standardizing the dyeing process and color fixation techniques. Participants practiced the dyeing process on batik cloth, following the predetermined steps, from material preparation, dyeing, drying, and color fixation. After the process was complete, participants evaluated the dyeing results and compared the level of color uniformity. The activity concluded with a discussion on product quality control and the development of simple procedures that can be applied in daily production. Through this series of activities, participants gained not only theoretical understanding but also practical skills that can help improve the consistent quality of batik products produced by the MSME Lily Batik Khas Jepara.

This activity increases participants' understanding of proper color mixing techniques so that they can produce more consistent colors according to the desired design. Through direct practice, participants gain skills in determining more measurable dye compositions and applying coloring stages more systematically to reduce color variations between products. In addition, participants understand the importance of the color fixation process in increasing color resistance to washing and daily use. At the end of the activity, the partners succeeded in developing simple procedures for the coloring process and quality control as production guidelines. The implementation of this procedure is starting to show results in the form of increased color uniformity in the batik products produced and a reduction in products experiencing color discrepancies. This condition is expected to improve product quality, strengthen customer trust, and support the competitiveness of Lily Batik Khas Jepara MSMEs in an increasingly competitive market.

The results of activities in the digital marketing aspect show an increase in participants' understanding and skills in utilizing digital technology to support the marketing of batik products. The activity began with the delivery of material regarding the basic concepts of digital marketing, changes in consumer behavior in the digital era, as well as the importance of social media and marketplaces as a means of expanding market reach. In this session, participants were invited to identify the current marketing conditions and discuss various obstacles faced in promoting products digitally. The results of the discussion show that marketing is still carried out simply and is not supported by a planned digital strategy.

Following the presentation, the training continued with business social media management training, specifically on Instagram Business and Facebook Business. The resource person provided a demonstration on how to optimize a business profile, create a digital product catalog, utilize the insight feature, and build customer engagement through social media. Next, participants engaged in hands-on practice by updating their business account profiles, uploading products, creating compelling product descriptions, and learning how to use business features to support promotional activities. Through this training, participants began to understand the importance of building a consistent brand identity to increase customer trust.

The next phase focused on training in digital content creation and marketplace management. Participants learned about product photography techniques using smartphones, creating engaging promotional content, writing marketing copywriting, and using hashtag strategies to increase promotional reach. Furthermore, participants practiced creating a digital catalog and uploading products to marketplace platforms. By the end of the training, the Lily Batik Khas Jepara MSME had a more structured business social media account, more engaging promotional content, and a digital product catalog ready to be used as a marketing tool. These results demonstrate that partners' capacity in managing digital marketing has increased and is a crucial asset for expanding their market and enhancing their business competitiveness.

The mentoring phase followed the training and action learning activities to ensure that all the material provided could be applied sustainably in daily business activities. Intensive mentoring was provided through field visits, discussions, consultations, and technical guidance for the owners and employees of the Lily Batik Khas Jepara MSME. The mentoring focused on implementing standardized production processes and optimizing digital marketing, as introduced in the previous phase.

In terms of production, the community service team assisted partners in implementing more measurable color mixing techniques, standardizing the dyeing process, and controlling product quality. During the mentoring process, partners began implementing more systematic work procedures at every stage of production, from material preparation and color mixing to dyeing, and finally evaluating the final product. The mentoring results showed an increase in color uniformity in the batik products produced and a decrease in the level of color mismatches that were previously common in some products. Furthermore, partners developed simple guidelines to use as a reference for maintaining production quality.

In terms of digital marketing, mentoring focused on managing business social media, developing promotional content, and optimizing digital product catalogs. The community service team assisted partners in creating content upload schedules (content calendars), improving business profiles, developing more attractive product photos, and crafting informative product descriptions. The mentoring program demonstrated that MSMEs' social media accounts became more active and well-managed. Partners also began regularly publishing promotional content and utilizing available business features to enhance customer interaction.

An evaluation phase was conducted at the end of the program to measure the success of the community service activities in increasing the production capacity and digital marketing of the Lily Batik Khas Jepara MSME. The evaluation was conducted through field observations, interviews with owners and employees, and an assessment of the implementation of the training and mentoring outcomes (Pebruary & Ismanto, 2025). The evaluation focused on changes in knowledge, skills, and business practices before and after the community service program.

Table 2. Summary of Program Achievements

No	Achievement Aspect	Description
1	Production Quality Problems Identified	The assessment revealed that the dyeing process was not yet standardized, resulting in inconsistencies in color intensity and uniformity among batik products. This issue affected product quality and customer satisfaction, particularly for bulk orders requiring consistent color standards.
2	Need for Production Standardization Identified	The enterprise did not have a Standard Operating Procedure (SOP) for dyeing and quality control processes. As a result, quality evaluation was conducted informally, making it difficult to ensure product consistency.
3	Digital Marketing Strategy Problems Identified	The business had not implemented a structured digital marketing strategy. Promotional activities were conducted sporadically without clear objectives, target markets, or performance evaluation mechanisms.
4	Social Media Content Development Needs Identified	Promotional content on social media was limited and lacked consistency. Product photographs, captions, and branding elements had not been optimized to attract potential customers and increase engagement.
5	Underutilization of Digital Business Platforms Identified	Instagram Business, Facebook Business, and online marketplace features were not fully utilized. The enterprise had limited knowledge regarding digital catalog management, customer engagement tools, and online sales optimization.
6	Community Service Program Formulated	Based on the identified problems, the community service program was designed to include training on dyeing standardization, quality control, digital marketing strategy development, social media content creation, branding enhancement, and marketplace optimization.
7	Partner Commitment Established	The owner and employees of Lily Batik Khas Jepara expressed their commitment to actively participate in all training and mentoring activities and to implement the recommended improvements to enhance business performance and competitiveness.

The evaluation results for the production aspect indicate an improvement in partners' ability to implement a more standardized dyeing process. Partners are able to use more measured dye compositions and implement more systematic work procedures compared to before the program was implemented. Furthermore, awareness of the importance of quality control has increased, as evidenced by the implementation of quality checks at every stage of production. The impact felt by partners is increased color uniformity in batik products, resulting in more consistent product quality and meeting customer expectations.

Table 3. Before-and-After Comparison of Production (Dyeing) Quality Indicators

Indicator	Condition Before the Program	Condition After the Program
Color consistency across production batches	Frequent variation in intensity and uniformity due to manual, unstandardized dyeing	Noticeably more uniform color across batches following standardized dyeing procedures
Availability of written SOPs	No written SOP for dyeing or quality control	Simple written dyeing and quality-control SOP developed and used as a production reference
Quality control practice	Defects identified only after production was complete; evaluation conducted informally	Quality checks conducted at each stage of production
Dye composition measurement	Dye mixed largely by estimation, without standard measurement	Dye composition measured more systematically using simple measuring tools

As Table 3 shows, the most notable shift was the enterprise's move from purely informal, after-the-fact quality checking toward a written SOP applied throughout the production process, which partners identified as the main driver of the improved color uniformity described above.

In terms of digital marketing, the evaluation indicates that partners are able to manage their business social media accounts more professionally. Their Instagram Business accounts have been equipped with more engaging business information, product catalogs, and promotional content. Partners have also begun implementing digital marketing strategies through regular content uploads, the use of relevant hashtags, and more active interaction with customers. Furthermore, the digital product catalogs have made it easier for potential customers to obtain product information and place orders.

Table 4. Before-and-After Comparison of Digital Marketing Indicators

Indicator	Condition Before the Program	Condition After the Program
Digital marketing strategy	No structured or planned strategy; promotion conducted incidentally	Structured digital marketing plan developed and implemented independently by partners
Business account features (Instagram/Facebook Business)	Underutilized: limited profile information, no digital catalog	Optimized with complete business information, insight features, and a digital product catalog
Promotional content	Limited and inconsistent posting, simple product information only	Regular uploads through a content calendar, with more engaging visuals and copywriting
Marketplace / online sales channels	Not used; sales confined to local customers and conventional channels	Product listings created and actively managed on an online marketplace

As summarized in Table 4, the clearest change was the shift from incidental, unplanned posting to a scheduled content calendar supported by a completed business profile and digital catalog, which partners linked to greater customer engagement on their accounts.

The findings from this community service program align with and extend several literatures on MSME empowerment, quality management, and digital marketing capability development. The shift from ad hoc dyeing practices to independently implemented SOPs, and from sporadic promotions to structured digital marketing strategies, supports the underlying premise of the Participatory Action Learning approach: sustainable behavior change in small businesses is more likely when partners act as co-producers of solutions rather than passive recipients of training (Effendi & Rokhayani, 2025). Because partners are involved from problem identification to evaluation, the resulting SOPs and marketing routines reflect the firms' own self-designed practices, which is consistent with the empowerment literature's argument that ownership of the change process increases the likelihood that new routines will be maintained after external mentoring ends.

The improvements in dyeing consistency reported in Tables 3 and 4 are consistent with quality management studies in the batik sector that show that SOP-based interventions and structured quality control are among the most effective ways to reduce color-related defects in small batik businesses (Kalilah et al., 2026; Sutanto et al., 2025). This reinforces the view that the absence of standard procedures, and not simply a lack of skills, is the primary driver of quality inconsistencies in traditional batik production, and that formalizing implicit informal knowledge into written procedures is itself a meaningful production quality intervention.

From a marketing perspective, the company's development from an underutilized Instagram account to an actively managed Instagram Business and Facebook Business presence, supported by a digital catalog and content calendar, corroborates previous findings that structured digital marketing capabilities, not just platform adoption, are what drive increased competitiveness for MSMEs (Affandi et al., 2024; Sofian et al., 2024; Yani et al., 2025). This is also consistent with previous evidence that Instagram's business features are often under-optimized by MSMEs even when the platform itself has been adopted (Hanifa et al., 2021), and with literature specific to the batik sector that argues that digital marketing strategies, not just product quality, are key to competitiveness in the post-pandemic market (Mansur et al., 2023).

Overall, these results suggest that production standardization and digital marketing capability development are complementary rather than independent levers of MSME competitiveness: a more consistent product provides something worth systematically promoting, while a more structured marketing presence creates channels through which quality improvements can be communicated to a broader market. This dual effect is consistent with the broader argument that MSME competitiveness depends simultaneously on operational and digital transformation capabilities, rather than on either dimension alone (Purnomo et al., 2024; Sinha et al., 2024).

Beyond confirming the general premise of the PAL approach, several factors help explain why the method was effective in this setting. First, embedding training within actual production and marketing tasks, rather than delivering it as stand-alone lectures, allowed partners to test new dyeing and marketing routines immediately and receive corrective feedback within the same production cycle, consistent with action-learning theory's emphasis on

tight feedback loops between action and reflection. Second, the sustained engagement of the owner and employees throughout problem identification, training, and mentoring reduced the usual gap between externally introduced knowledge and locally usable practice, since solutions were built around the specific dyeing materials, tools, and customer base already used by the enterprise rather than generic best practice. Third, intensive field-based mentoring provided a structured space in which early implementation errors, such as inconsistent measurement of dye composition or irregular content-posting schedules, could be corrected quickly rather than persisting until a formal evaluation.

At the same time, the mentoring process revealed several challenges that partly limited the pace of change. Partners' limited prior exposure to structured quality control meant that certain dyeing standardization sessions had to be repeated before consistent SOP compliance was achieved. Similarly, sustaining a regular content-posting schedule for social media required more hands-on reminders and follow-up visits than initially planned, reflecting the partners' limited experience with routine digital content production alongside their daily production workload. These experiences suggest that PAL-based interventions in similarly resourced batik MSMEs should budget for a longer or more intensive mentoring phase than the three months allocated in this program, particularly where quality control and digital marketing routines must be built up from a low baseline at the same time.

Several limitations should be noted when interpreting these findings. The evaluation relies primarily on observations, interviews, and internal documentation over a relatively short program period of three months, which limits the ability to assess the long-term sustainability of changes or to statistically test the significance of quantitative indicators. Because this study involved a single MSME partner, the findings should be read as a case-level demonstration of the PAL approach rather than as evidence that can be generalized to batik MSMEs as a whole. Future public service and applied research could expand on this work through longer monitoring periods, comparisons across partner companies, and closer engagement with local business associations and government support programs, which have been shown to play a critical role in sustaining improved SME performance over time (Suprayitno et al., 2025).

CONCLUSION

The community service program implemented by the Lily Batik Khas Jepara MSME successfully increased the capacity of partners in production and digital marketing. Through a Participatory Action Learning (PAL) approach, partners were actively involved in every stage of the activity, from problem identification, training, hands-on practice (action learning), mentoring, and evaluation. In the production aspect, the training and mentoring activities successfully improved partners' understanding and skills in standardizing the dyeing process, color formulation techniques, color fixation, and product quality control. Implementing more standardized practices improved color consistency and the quality of the resulting batik products.

In the digital marketing aspect, the community service program successfully improved partners' abilities in managing social media, creating engaging promotional content, developing digital product catalogs, and utilizing business features on digital platforms to support product marketing. Partners also began implementing more structured digital marketing strategies, expanding their promotional reach and enhancing customer interactions. These changes demonstrate that digital marketing can be an effective means of increasing the competitiveness of batik MSMEs in the digital economy era.

Beyond its practical outcomes, this program contributes conceptually to the literature on MSME empowerment by illustrating how Participatory Action Learning can be used to address production and marketing constraints simultaneously, rather than as separate empowerment tracks, within a single partner-driven cycle of problem identification, training, mentoring, and evaluation. This integrated framing offers a template that future MSME empowerment programs, particularly in traditional craft sectors such as batik, may adapt when partners face compounding constraints in both product quality and market access. Future community service and applied research could extend this work by testing the framework across multiple batik MSME partners, incorporating longer post-program monitoring to assess the durability of SOP compliance and digital marketing routines, and collaborating with local business associations and government support programs to scale production standardization and digital marketing capacity building across the wider Jepara batik cluster.

The community service program has had a positive impact on strengthening the business capacity of the Lily Batik Khas Jepara MSME. Improved production quality, supported by optimized digital marketing, provides crucial capital for partners to increase competitiveness, expand market access, and support business sustainability. Therefore, continued mentoring and ongoing development of digital innovation are necessary to ensure the program's benefits continue to grow and contribute significantly to the growth of batik MSMEs in Jepara Regency.

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