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Community-Based Training on Burning and Wall Paint Finishing Techniques to Enhance Antique Wood Effects among Local Craft Practitioners

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Abstract

Strengthening innovation within local craft communities requires mentoring approaches that encourage experimentation using accessible materials. This community-based training program was conducted in collaboration with Barata Sena Woodcraft, a small-scale enterprise in Surakarta employing eight local craftsmen. The activity aimed to introduce burning and wall-painting techniques as an alternative approach to enhancing the visual effects of antiques on wooden products. The program adopted a participatory model consisting of needs identification, technical demonstrations, guided practice, and reflective discussions. Participants were directly involved in wood preparation, controlled burning, and the application of layered wall paint to explore variations in texture and color intensity. Observational records and participant reflections indicate that 6 of 8 craftsmen (75%) perceived the technique as easy to integrate into their daily workflow. In contrast, seven participants (87.5%) reported increased confidence in experimenting with alternative finishing materials. The training also encouraged collaborative learning and creative exploration, contributing to product diversification and improved aesthetic value. These findings suggest that contextualized mentoring activities can support community empowerment by bridging traditional craftsmanship with adaptive finishing practices that remain feasible within small-scale production settings.

Keywords: Community Empowerment; Craft Training; Wood Finishing; Antique Effect; Participatory Mentoring.

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Introduction

Finishing is a crucial stage in the lifecycle of craft production, as it shapes both the product's visual identity and functional durability. Rather than being merely a final coating process, finishing practices influence how materials are perceived, maintained, and valued within broader cultural and industrial contexts. In small-scale craft environments, finishing techniques are often developed through practical experience and adaptation rather than formal technical training. Common finishing approaches, such as engraving, polishing, and coating, remain widely applied due to their familiarity and accessibility among craftsmen (Kantaros et al., 2024; Yuan & Jinsong, 2023). However, evolving consumer expectations increasingly encourage craft communities to explore finishing methods that offer distinctive textures and aesthetic differentiation.

In woodcraft production, finishing not only enhances appearance but also provides long-term protection against environmental exposure, biological deterioration, and chemical interactions. These protective qualities extend the lifespan of wooden products while simultaneously improving their market appeal. The perceived artistic value generated through finishing is closely linked to product uniqueness and resale potential, particularly in craft markets where visual authenticity plays a central role (Radermecker & Loots, 2025; Sams et al., 2022). Consequently, the development of adaptive finishing strategies has become an important aspect of sustaining local craft competitiveness.

Coloring processes constitute a significant component of finishing practice, as they influence the emotional and visual interpretation of handcrafted objects. Previous community-based training activities have demonstrated that the application of traditional motifs and coloring techniques can strengthen artisans' creative identity while expanding their technical repertoire (Hendriyana et al., 2025; Tonthongkam et al., 2024). The diversity of finishing materials, from

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polish and varnish to modern coating compounds, illustrates the continuous transformation of craft technologies, shaped by both cultural heritage and industrial innovation (Newisar et al., 2024). Nevertheless, many small workshops encounter limitations in accessing specialized finishing products due to cost constraints or the complexity of application procedures.

The growing emphasis on environmentally conscious production has also influenced the development of alternative finishing materials, including water-based lacquer systems that reduce chemical emissions while maintaining comparable surface performance (Hassanpour et al., 2024; Newisar et al., 2024; Randhawa, 2024). Although these innovations offer promising advantages, their adoption within local craft communities remains uneven. Differences in material characteristics and application techniques often create uncertainty among practitioners about the most effective finishing approaches to achieve desired aesthetic outcomes (Borthakur, 2025; Hoseini & Naeeni, 2025). This condition highlights the need for contextualized mentoring activities that bridge technical knowledge with everyday craft practice, enabling artisans to experiment safely while preserving their creative autonomy (Sagdeo & Khan, 2024; Zabulis et al., 2023).

In response to these challenges, community-based initiatives have increasingly explored adaptive finishing strategies that combine traditional craftsmanship with accessible contemporary materials. Research on finishing development emphasizes the importance of understanding how material selection and application techniques influence texture formation, durability, and visual perception (Shao et al., 2024; Sristi & Zaman, 2024). Such explorations not only contribute to technical knowledge but also create opportunities for local industries to innovate using readily available resources within their production environments. From a community empowerment perspective, mentoring activities that encourage experimentation with alternative materials can foster creative resilience while supporting sustainable craft ecosystems (Dushkova & Ivlieva, 2024; Suyatna et al., 2026).

The present community-based training program was conducted in collaboration with Barata Sena Woodcraft, a small-scale enterprise located in Surakarta. Prior to the activity, craftsmen at the workshop primarily relied on conventional finishing methods that produced uniform color surfaces with limited textural variation. Informal discussions with the workshop owner revealed interest in exploring antique-style finishing effects to enhance product uniqueness without requiring expensive industrial materials. Building on this context, the mentoring program introduced controlled burning techniques, combined with wall paint finishes, as an accessible approach to creating layered visual effects. The initiative was designed not only to expand technical skills but also to encourage collaborative learning among participants, fostering practical experimentation as a shared process within the craft community. Through this approach, the program sought to strengthen artisans' capacity to reinterpret finishing practices while maintaining alignment with local production realities.

Method

The community-based training program adopted a participatory mentoring approach that emphasized experiential learning in the real production environment of Barata Sena Woodcraft in Surakarta. The activity involved eight craftsmen who participated directly in guided practice sessions designed to introduce adaptive finishing techniques while maintaining alignment with their existing workflow. Rather than positioning the activity as a laboratory experiment, the mentoring process encouraged collaborative exploration, allowing participants to reinterpret finishing practices through practical engagement.

The implementation began with a preparatory stage in which the mentoring team and craftsmen discussed material selection, safety considerations, and expected aesthetic outcomes. Environmental awareness and the increasing use of water-based finishing materials were introduced as contextual knowledge to support participants' understanding of alternative finishing practices. Water-based lacquer systems, which rely on water as a diluent and produce lower chemical emissions, were presented as an example of evolving finishing technologies that balance environmental concerns with surface durability (Abubakar et al., 2026; Akhter et al., 2025).

During the technical mentoring sessions, participants were guided through a sequence of hands-on activities. The first stage involved wood preparation, including selecting light-colored, coarse-grained wood types such as pine or young mahogany, followed by cutting and sanding to achieve clean surfaces. Surface treatment practices were discussed

collectively to ensure that each participant understood how material characteristics influence finishing results. Controlled burning techniques were then demonstrated using an LPG torch, with emphasis placed on maintaining moderate heat exposure to reveal natural wood grain without compromising structural integrity (Andrey Borisovich et al., 2023; Borisovich et al., 2023).

After the burning stage, participants explored using diluted wall paint as an accessible coloring medium. Thin layers of paint were applied using brush and spray techniques to observe variations in color intensity and texture development. Some wooden samples received single-layer coatings, while others were intentionally layered two or three times to encourage comparative reflection among participants (Bessières et al., 2013; Kirkbride, 2015). The drying process and final visual observation were conducted collaboratively, allowing craftsmen to discuss differences in grain visibility, tonal variation, and perceived antique effects generated through the combination of burning and coloring techniques (McCloy et al., 2025; Sandu et al., 2025).

Materials used during the mentoring included wall paint, water-based paint solutions, Bayclin as a bleaching agent, and clear-coating materials for surface sealing. Tools such as LPG torches, wire brushes, sandpaper, spray equipment, and water hoses were used in accordance with safety guidelines to minimize risk during the burning process (Bond & Merrin, 2022). Documentation was conducted through photographic recordings and written notes to capture both technical procedures and participants' reflections throughout the activity (Amerson & Livingston, 2014; Armstrong et al., 2022; Strand et al., 2017; Valdiviezo Palacios & Marino Jiménez, 2026).

The mentoring sessions also included reflective dialogue, in which participants shared their impressions of the techniques' practicality and potential integration into daily production routines. The workshop owner and craftsmen evaluated the visual outcomes together, discussing how the antique effects achieved through burning and wall-painting finishing could contribute to product differentiation and broader market appeal. This participatory evaluation approach allowed knowledge to emerge through interaction rather than solely through instructor-driven instruction, reflecting the core principles of community-based learning (Hong et al., 2024; Jaeger et al., 2023).

Results and Discussion

The outcomes of the community-based mentoring program at Barata Sena Woodcraft demonstrate that adaptive finishing techniques can be integrated into small-scale production systems without disrupting existing workflows. This section presents the findings in a structured manner, beginning with material characteristics, followed by application processes, aesthetic interpretation, and participant responses. The discussion integrates technical observations with theoretical perspectives to situate the activity within the broader discourse of craft innovation.

Characteristics of Color-Producing Materials

The mentoring sessions identified two principal material combinations for generating antique visual effects: (1) diluted wall paint mixed with a water-based solvent, and (2) controlled burning followed by bleaching treatment using Bayclin. These materials were selected because they were readily available in the workshop, enabling experimentation without increasing production costs. The materials introduced during the activity are shown in Figure 1.

Figure 1. Color-Producing Materials Used during the Mentoring Program

The wall paint demonstrated strong surface coverage due to its film-forming properties. Participants observed that pigment density influenced color saturation, particularly when applied in layered coats. Opacity could be adjusted by dilution, allowing variation from fully opaque finishes to semi-transparent tones that retained visible wood grain. This observation aligns with the finishing theory, which states that binder concentration and pigment dispersion determine coating behavior and visual intensity (Lee & Lee, 2022; Nagaraj et al., 2026; Rivera González et al., 2025).

In contrast, the burning technique altered the wood surface structurally rather than coating it. Controlled thermal exposure darkened cellulose and enhanced grain contrast. Subsequent bleaching treatment softened the carbonized surface, producing a grayish antique effect. Prior studies indicate that surface carbonization modifies fiber structure and affects light reflection patterns, thereby influencing perceived texture and color (Peng et al., 2020; Shokrani Havigh & Mahmoudi Chenari, 2022). The contrast between pigment deposition and surface oxidation illustrates two distinct aesthetic mechanisms. While wall paint builds color externally, burning and bleaching transform the substrate internally. This distinction became central to participants' understanding of variation in finishing.

Application Process and Surface Transformation

The implementation sequence consisted of sanding, controlled burning, layered coloring, bleaching, and comparative evaluation. Surface preparation through sanding improved coating adhesion and ensured consistent absorption, supporting findings that surface roughness directly influences finishing performance (Dvořák et al., 2025; Yu et al., 2023). The burned wood surface before bleaching treatment is presented in Figure 2.

Figure 2. Carbonized Wood Surface after Controlled Burning

The carbonized texture enhanced grain visibility and created a cracked surface pattern characteristic of aged wood. However, participants noted that excessive heat exposure led to brittle surfaces, underscoring the importance of flame control. For pigment-based finishing, diluted blue wall paint was applied in controlled layers. The outcome of this process is presented in Figure 3.

Figure 3. Blue Wall Paint Mixed with Water-Based Solution

As shown in Figure 3, solvent dilution produced a lighter chromatic tone with subtle greenish undertones. Increased layering intensified color depth while gradually reducing grain transparency. Participants reported that two-layer applications provided an optimal balance between color richness and the preservation of natural texture. In contrast, bleaching of carbonized wood produced tonal softening, as illustrated in Figure 4.

Figure 4. Antique Effect Produced through Controlled Burning

Figure 4 demonstrates how chemical oxidation modified the deep black carbon tone into a muted gray finish while preserving textural depth. This outcome aligns with traditional yakisugi principles, in which controlled charring enhances both visual character and surface resilience (Ebner et al., 2022). To clarify differences between techniques, Table 1 summarizes observed characteristics.

Table 1. Application Stages and Observed Visual Outcomes

Stage	Activity	Observed Result
Surface Preparation	Sanding and cleaning	Improved adhesion and smooth texture
Burning Process	Controlled flame exposure	Enhanced grain visibility
Coloring	Layered wall paint application	Opaque and saturated tones
Bleaching	Bayclin spraying	Grayish antique effect
Evaluation	Visual comparison	Identification of optimal finishing combinations

The comparison shows that the interaction between material properties and practitioner skill shapes finishing outcomes. Each stage contributed incrementally to aesthetic transformation rather than functioning as an isolated procedure.

Color Variation and Aesthetic Interpretation

Variation in color intensity depended on wood type, dilution ratio, and application sequence. Wall paint coatings produced stronger, more uniform surfaces, whereas burning combined with bleaching preserved organic grain patterns and created more nuanced tonal transitions. Wood species with larger grain structures, such as rain tree and teak, absorbed finishing materials more evenly, resulting in sharper visual contrast. Dense woods with darker base tones displayed less pronounced antique effects.

These findings reinforce the understanding that substrate characteristics influence the penetration and durability of finishing (Abellán-Nebot et al., 2024; Ranjan & Das, 2022). Beyond technical factors, participants interpreted antique finishing as an expression of authenticity rather than purely decorative enhancement. Revealing grain patterns was perceived as maintaining the handcrafted identity of their products while responding to contemporary aesthetic preferences. Such interpretation supports the argument that craft innovation involves reinterpretation of material meaning rather than technological replacement (Bratland, 2024; Kofler & Walder, 2024).

Participant Response and Community Impact

Reflective dialogue revealed that 6 of 8 participants (75%) perceived the techniques as relatively easy to integrate into their workflows. Seven participants (87.5%) reported increased confidence in experimenting with alternative finishing materials after the mentoring sessions. These responses indicate that participatory, practice-based learning effectively strengthened technical autonomy.

Beyond skill acquisition, participants discussed potential product diversification. Antique gray finishes were considered suitable for rustic dining tables and export-oriented furniture markets, while layered paint finishes were viewed as appropriate for decorative indoor pieces. The ability to produce a range of surface effects without purchasing specialized industrial coatings was perceived as economically advantageous.

These outcomes suggest that community-based mentoring contributes not only to technical improvement but also to strategic thinking regarding product positioning and market differentiation. Hands-on experimentation encouraged collaborative knowledge exchange and reduced hesitation toward material innovation (Halliburton et al., 2024; Rahman et al., 2025). Challenges identified included inconsistent results on dense wood types and safety concerns during prolonged burning. Participants emphasized the need for continued practice and structured safety reinforcement in future activities.

Critical Interpretation

The mentoring activity illustrates that antique finishing functions as a socio-material practice shaped by interaction among tools, materials, and collaborative learning processes. Innovation emerged through reinterpretation of accessible materials rather than reliance on industrial systems. This aligns with sustainable craft perspectives, emphasizing local experimentation as a foundation for resilience (Liu & Li, 2025; Newisar et al., 2024). The program demonstrates that adaptive finishing techniques can expand the aesthetic vocabulary, enhance product differentiation, and strengthen artisans' decision-making under realistic production conditions. Such outcomes reinforce the role of contextualized mentoring as a practical mechanism for community empowerment.

Conclusions

The community-based mentoring program at Barata Sena Woodcraft demonstrates that accessible finishing techniques can effectively strengthen innovation within small-scale craft enterprises. The integration of layered wall-paint application and controlled burning, followed by bleaching treatment, provided alternative approaches to producing antique visual effects while maintaining production feasibility. Wall-paint mixtures offered flexible color modulation and were relatively easy to incorporate into routine workflows, whereas burning and bleaching techniques produced stronger textural authenticity but required higher technical control. Participant feedback confirmed both the practicality and confidence-building impact of the mentoring approach. Beyond technical outcomes, the activity fostered collaborative experimentation, encouraged product diversification strategies, and strengthened participants' ability to evaluate material behavior critically. The findings suggest that participatory mentoring can bridge traditional craftsmanship with adaptive finishing practices, contributing to sustainable innovation and community empowerment within the local woodcraft sector.

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Contribution

Defrata Harjuna Putra conceptualized the mentoring framework, coordinated field implementation, and supervised the technical experimentation process. Yuniana Cahyaningrum designed the participatory training model, conducted observational documentation, analyzed participant responses, and drafted the manuscript. Both authors contributed equally to data interpretation, manuscript revision, and final approval of the submitted version.

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