

The Development of Eco-Friendly Calligraphy Artwork Using Rice Husk Paper and Eggshell Materials at El-Ka Lampung Calligraphy Studio

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Abstract	Article Info
Indonesia generates significant quantities of agricultural waste, including eggshells and rice husks, which often remain underutilized. This research-based community service project explores the innovative reuse of these materials—particularly rice husks—as eco-friendly components in the creation of calligraphy artworks. The objectives of the initiative were twofold: (1) to introduce and highlight the potential of eggshells and rice husks as sustainable, alternative materials for calligraphic art; and (2) to provide hands-on training on the practical techniques of producing calligraphy using eggshell fragments and rice husk-based paper. Utilizing the Asset-Based Community Development (ABCD) approach, the project actively involved the El-Ka Lampung Calligraphy Studio community in Metro City, Lampung. The outcomes of the initiative included the successful production of calligraphy pieces that exhibited both aesthetic appeal and distinctive textures resulting from the incorporation of organic materials. Moreover, the project fostered greater community awareness of environmentally sustainable art practices and enhanced participants' skills in utilizing local waste products creatively. This initiative demonstrates how integrating traditional art with ecological awareness can empower communities and promote sustainable cultural innovation.	Article History <i>Received :</i> June 22, 2023 <i>Revised :</i> October 06, 2023 <i>Accepted :</i> November 29, 2023 Keywords: <i>Calligraphy Artwork, Eco-Friendly Calligraphy, Lampung Calligraphy Studio</i>
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INTRODUCTION

Organic and inorganic waste refers to non-useful materials derived from households and industries (Ezebilo & Animasaun, 2011). These materials, ranging from food scraps and agricultural residues to plastics and industrial byproducts, accumulate rapidly due to urbanization and consumption patterns. Poor waste management exacerbates environmental degradation, contributing to soil contamination, water pollution, and greenhouse gas emissions. Effective waste management is critical for environmental sustainability, as improper handling poses significant threats to ecosystems and public health. While waste is considered worthless to many, it serves as a source of ideas and inspiration for artists (Aykanat, 2014; Zhang & Shen, 2024), who reinterpret discarded materials as mediums for innovation. Today, numerous artists repurpose waste into creative products [4], aiming to reduce raw material costs, minimize ecological footprints, and promote environmental conservation through art that challenges conventional perceptions of value.

Eggshells are waste generated from hatcheries, households, and fast-food industries (Amu, Fajobi, & Oke, 2005; Kavitha, Geetha, & Jacqueline, 2019; King'ori, 2011), which can be collected in large quantities due to global egg consumption exceeding 1.3 trillion annually. Untreated eggshell waste contributes to environmental pollution by releasing methane during decomposition and clogging landfills. However, eggshells can be processed into beneficial products such as fertilizer (Jiao et al., 2018), artwork (Hempe, 2020), animal nutrition (Quina, Soares, & Quinta-Ferreira, 2017), construction materials (Pliya & Cree, 2015), adsorbents (Santos, Arim, Lopes, Gando-Ferreira, & Quina, 2019), and industrial catalysts (Laca, Laca, & Diaz, 2017). Their calcium-rich composition (95% calcium carbonate) makes them versatile for applications in agriculture, art, and manufacturing. For instance, powdered eggshells enhance soil fertility, while their textured surface adds aesthetic value to mixed-media artworks, bridging sustainability and creativity.

Supardji Kahar, an artist from Gedangan Village, Mojokerto Regency, as documented in Christiningrum and Prabowo's journal (Christiningrum & Prabowo, 2015), creates visual art from eggshell waste using collage techniques. His work exemplifies the intersection of cultural heritage and environmental stewardship, drawing inspiration from traditional Javanese motifs. The study concluded that Kahar's process involves creative stages: conceptualizing ideas, material processing, and execution (preparing tools, sketching, cutting eggshells, and adhering them to sketches via collage). After covering the sketch with eggshells, the artwork undergoes calcium coating to strengthen adhesion, sanding to smooth irregularities, coloring with natural dyes for vibrancy, and finishing with protective varnish. The resulting pieces possess high artistic value, symbolic meaning, and cultural significance, often depicting themes of nature and community resilience. Kahar's approach has inspired local artisans to adopt sustainable practices, fostering a circular economy in rural Indonesia.

In a prior community service initiative reported in the book *Research-Based Community Service: Utilizing Rice Husks as Paper for Calligraphy Media* (Zarnuji, Amrulloh, & Azizah, 2019), the authors transformed rice husk waste into paper for calligraphy. This project, conducted with the EL-KA Lampung Calligraphy Studio in Metro City, employed the Asset Based Community Development (ABCD) method, emphasizing local resource optimization and participatory learning. Workshops trained artists in pulping rice husks, blending fibers with recycled paper, and pressing sheets for calligraphy. The outcomes included enhanced knowledge and skills among calligraphy artists in repurposing rice husks into paper, producing unique calligraphic artworks that introduced innovation to the field and supported creative industry development. Participants reported increased economic opportunities, as their eco-friendly artworks gained recognition in regional exhibitions and online marketplaces. The project also strengthened community cohesion, as artists collaborated to refine techniques and market their creations.

Building on these findings, this study focuses on developing eco-friendly calligraphy artworks by combining eggshells and rice husk paper. It aims to advance artistic competence, foster new creative methods in calligraphy, and provide insights into sustainable waste utilization. By integrating eggshell fragments into rice husk paper, artists can achieve multidimensional textures and visual depth, elevating traditional calligraphy into contemporary mixed-media art. The initiative also explores scalable production methods to ensure affordability and accessibility for low-

resource communities. Through this project, the community service initiative seeks to deliver novel information on waste repurposing, enhance the artistic and economic value of the resulting artworks, and inspire policy changes to support eco-art initiatives. Ultimately, it underscores the role of art in driving environmental awareness and sustainable development, transforming waste into symbols of cultural and ecological renewal.

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METHOD

This community engagement activity was conducted at EL-KA Lampung Calligraphy Studio in Metro City using the Asset-Based Community Development (ABCD) approach. This method emphasizes the utilization of existing community assets and potentials. The ABCD approach is grounded in the belief that the main driver of change within a community lies in its capabilities and available resources. This paper outlines the stages of assistance and the tools used in identifying and recognizing assets within the ABCD framework.

1. Appreciative Discovery

The initial stage involves appreciative discovery, which refers to acknowledging and valuing past successes and the capabilities of the community. The underlying assumption of this stage is that every organization possesses assets that sustain and empower the community. The subsequent process encourages positive change by focusing on past experiences and achievements. Appreciative Inquiry serves as a constructive means for organizational transformation, based on the simple assumption that highlighting strengths leads to more sustainable development.

2. Asset Development Analysis

In this stage, after identifying their internal assets and potentials, the community members formulate and pursue a shared vision. During the Focus Group Discussion (FGD), the community expressed aspirations to utilize waste materials such as eggshells and rice husk paper to create calligraphy artworks. This vision was collectively approved, and the community agreed to focus on producing calligraphy using these materials as the main medium, in addition to planning the marketing of the resulting products.

Figure 1. Focus Group Discussion Activity



3. Program Strategy Analysis

The first step taken by the facilitators was to build rapport and gain the trust of the target group to ensure a smooth and effective facilitation process. After establishing trust, the facilitators conducted an FGD with members of the EL-KA Lampung Calligraphy Studio. In this session, the team formulated program strategies, gathered information, and co-developed a community vision. Based on the results, a strategy was developed to conduct training sessions on creating calligraphy using eggshells and rice husk paper, engaging all members of the studio in the process.

Tabel 1. Program Strategy Analysis

No	Asset	Dream	Mentoring Strategy
1	Availability of raw materials and member skills: The studio has access to abundant agricultural waste (eggshells and rice husks) and members with basic calligraphy skills.	Empowering awareness and creativity: To inspire members to recognize the untapped value of eggshells and rice husks as sustainable artistic materials, fostering innovation and environmental stewardship.	Collaborative expert-led training: Partner with eco-artists and material scientists to design workshops on transforming waste into calligraphy media. Training includes techniques for processing eggshells (cleaning, grinding, texturing) and crafting rice husk paper (pulping, sheet-forming).
2	Strengthened member capacity: Members have prior experience in waste-based art (e.g., rice husk paper calligraphy) and a growing interest in sustainable practices.	Enhanced effectiveness and scalability: To refine members' technical skills in integrating eggshells and rice husk paper into calligraphy, ensuring consistent quality and artistic appeal for market-ready products.	Hands-on facilitation: Provide tools (e.g., molds, adhesives, natural dyes) and step-by-step guidance during collaborative art sessions. Establish peer mentorship systems to share best practices for material preparation,

			layering eggshell fragments, and finishing techniques.
3	Digital marketing infrastructure: The studio has access to social media platforms (Instagram, Facebook) and e-commerce websites (Shopee, Etsy) for outreach.	Economic self-reliance: To achieve financial sustainability by promoting and selling eco-friendly calligraphy artworks online, expanding the studio's customer base locally and internationally.	Digital marketing support: Train members in content creation (product photography, storytelling), SEO optimization, and online sales management. Collaborate with influencers or eco-art communities to amplify visibility and build brand identity around "sustainable calligraphy."

4. Implementation of the Program

The final stage involves the implementation of the various plans and strategies that were formulated during the Focus Group Discussion (FGD). This step marks the realization of the community's collective dreams through concrete actions. The community members, with support from facilitators, began producing calligraphy using eggshells and rice husk paper as agreed upon in the earlier stages. Additionally, efforts were initiated to develop marketing strategies to promote and distribute the finished calligraphy products, thereby enhancing the sustainability and economic impact of the program (Syarifuddin & Nildawati, 2017).

The ABCD-based community engagement program was conducted over a five-month period, starting in July 2021 and concluding in November 2021. The program took place at the EL-KA Lampung Calligraphy Studio, located at Jl. Kelengkeng II, Yosomulyo Subdistrict, Metro Pusat District, Metro City, Lampung Province, Indonesia. The location was selected due to the studio's active role in promoting Islamic art and community-based creativity. The studio serves as a hub for youth and local artisans interested in developing calligraphy skills using accessible and sustainable materials. A total of 30 participants were involved in this program. The participants came from various backgrounds, including students, local artists, and community members, all sharing a common interest in Islamic calligraphy and creative reuse of local materials.

RESULT AND DISCUSSION

1. Overview of the Community Engagement Process

Community engagement is a widely adopted strategy by groups, government institutions, and nonprofit organizations to enhance the quality and capacity of human resources. It enables individuals to identify themselves as part of the problem and encourages them to explore alternative solutions. Human resource capabilities are largely influenced by individuals' awareness and empowerment, which underscores the need for continuous capacity-building efforts in every engagement process.

In this initiative, based on the asset development and strategic analysis, it was concluded that meaningful change in the EL-KA Lampung Calligraphy Studio could be facilitated through training programs focused on producing calligraphy artworks using recycled eggshells combined with rice husk paper—materials the community had already previously utilized. This activity encouraged studio members to combine their confidence and skills to address environmental issues, particularly in

repurposing eggshell and rice husk waste into eco-friendly artistic creations.

2. Data Discussion

This community service project aimed to enhance both knowledge and technical skills in producing environmentally friendly calligraphy artwork using eggshells and rice husk paper. The implementation followed the Asset-Based Community Development (ABCD) approach.

The first step was Appreciative Discovery, which involved listening to stories of past successes and acknowledging the community's existing capabilities. EL-KA Lampung Calligraphy Studio is a community of calligraphy artists in Metro City, founded in 2002 by Mr. Awang Subianto. The studio currently has about 50 active members, including students, religious boarding school alumni, university students, and graduates. Activities in the studio include regular practice sessions aimed at both improving calligraphy skills and preparing for MTQ (Musabaqah Tilawatil Quran) competitions.

Members of the studio have achieved notable success, including winning city, provincial, and national-level MTQ competitions in the calligraphy category. These achievements affirm the members' advanced skill levels in calligraphy. In 2018, the studio received assistance in transforming rice husk waste into handmade paper for calligraphy use. This training allowed members to produce paper from rice husks, resulting in a high-value, eco-friendly art medium. Based on these outcomes, the present program was developed to expand the scope by combining this paper with eggshells to create sustainable calligraphic artwork.

The next phase involved Asset Development Analysis. EL-KA Lampung Calligraphy Studio is located in Metro City, where eggshell and rice husk waste are abundant. These materials are also accessible from nearby areas such as Central Lampung and East Lampung Regencies. During a Focus Group Discussion (FGD), the community formulated a shared vision to create calligraphy using these two materials. The group reached a consensus to focus this engagement specifically on artwork creation and product marketing.

The final step was Strategic Analysis and Program Implementation. During the FGD, researchers helped design the program strategy, collect supporting data, and shape the community's vision for the studio. This included providing hands-on training sessions in producing calligraphy using eggshells and rice husk paper. To optimize these resources, participants were encouraged to recognize the value of both the materials and their creativity. Experts were brought in to support the training, including Awang Subianto and M. Sangidun as the main resource persons, and Ansori and Khalim as additional speakers, selected for their expertise in visual arts and calligraphy.

Capacity building focused on hands-on facilitation of the calligraphy production process using the selected materials. The steps were as follows:

- Prepare a sheet of cleaned rice husk paper and adhere it to a wooden board (e.g., plywood).

Figure 2. Attaching rice husk paper to a wooden board.



- Draw a rough sketch of the desired calligraphy design on the rice husk paper.

Figure 3. Sketching the design.



- Reinforce the sketch lines to form a clear pattern.

Figure 4. Tracing the outline.



- Sort the eggshells based on size (large and small pieces).
- Glue the eggshell fragments onto the sketch using wood glue.

Figure 5. Affixing eggshell fragments.



- Once all the pieces are attached, allow the artwork to dry.

Figure 6. Completed calligraphy artwork.



3. Follow-Up Actions

One essential component of the planned engagement program was the marketing of calligraphy artworks through social media and online platforms. This aspect aimed to promote the products more widely, enhance visibility, and build a sustainable economic model for the EL-KA Lampung Calligraphy Studio. Unfortunately, this component had not been fully implemented by the conclusion of the scheduled engagement period. The primary reason for this shortfall was time limitations, which restricted both the preparation and the execution of the digital marketing efforts. Although the team had outlined clear objectives for marketing, the implementation phase required more coordination and technical support than initially anticipated. The absence of immediate online marketing reduced the opportunity to test market response during the program period. Nevertheless, the experience highlighted the significance of digital tools in promoting community-based creative products. It also underscored the necessity of developing a structured marketing plan that integrates training in digital literacy. Furthermore, the lack of marketing progress signaled the importance of allocating specific roles and timelines in future engagements. It was agreed that members of the studio needed further support in managing and optimizing social media platforms. Marketing the artworks through

Instagram, Facebook, TikTok, and e-commerce sites such as Shopee or Tokopedia was considered a promising direction. Therefore, marketing remains a top priority for the post-engagement phase to ensure long-term impact and sustainability (Everett, Adekola, & Lamond, 2021).

As a response to this unfinished aspect, follow-up actions have been outlined to ensure continuity and future success. The first step will involve systematic monitoring and evaluation of the outcomes achieved during the initial engagement. This process will help identify what worked well and which areas need further development. By engaging participants in reflective assessments, the community will have the opportunity to learn from the experience and refine its strategies. In addition to evaluation, the implementation of digital marketing strategies will be resumed with a more focused and guided approach. This will include workshops on basic digital marketing, social media content creation, and product photography. The involvement of local youth with digital skills is also being considered as part of the follow-up (Olofsson et al., 2021). This collaboration could bridge the gap between traditional arts and modern promotional methods. Moreover, training sessions will emphasize brand identity, storytelling, and market targeting. A special team may be formed from among the participants to manage the online sales and marketing. These efforts aim to create a sustainable digital presence for the studio's products. Ultimately, the digital marketing initiative is expected to contribute significantly to the studio's economic independence and capacity building.

During the community engagement process, participants also encountered several technical challenges in producing their calligraphy artworks. One prominent issue involved the attachment of eggshell fragments onto the sketched surfaces of rice husk paper. While the idea of using recycled materials such as eggshells and rice husk paper was innovative and eco-friendly, it required precision and skill. The challenge became more apparent when participants worked on intricate or small-scale calligraphy patterns. The delicate nature of both the eggshells and the detailed sketches often resulted in breakage or misalignment. Participants found it difficult to apply glue uniformly or manage the positioning of the shell fragments without damaging the paper. These difficulties led to slower production times and inconsistent aesthetic results. Recognizing the problem, a group discussion was held to brainstorm possible solutions. As a result of the discussion, participants proposed a novel idea: converting the eggshells into a paste-like medium. This paste could then be applied more easily to the paper surface, allowing for smoother application even in narrow or curved sections of the design. The concept was inspired by the traditional *prada* technique used in Javanese calligraphy and gold leaf decoration. The proposed eggshell paste would preserve the texture and visual effect while improving the ease of use. This solution not only addressed a technical barrier but also encouraged innovation rooted in local cultural practices.

CONSLUSION

The Community Service Activity Based on Research for the Development of Environmentally Friendly Calligraphy Art Using Eggshells and Rice Husk Paper was implemented through a structured training program at the EL-KA Lampung Calligraphy Studio. This initiative adopted the Asset-Based Community Development (ABCD) approach, which emphasizes the utilization of existing community assets and potentials. The training aimed to empower the studio members by developing their

skills in creating calligraphy using waste materials that are often overlooked. Eggshells and rice husks, which are abundant in the local area, were chosen as the primary media for this innovative art form. Participants were guided through the technical processes of preparing, designing, and assembling the materials into finished calligraphy artworks. The service activity was designed not only to enhance artistic skills but also to promote environmental awareness and sustainable practices. As a result, members of the studio gained new insights into eco-friendly art production. They also developed the ability to creatively repurpose organic waste materials into valuable artistic expressions. The program encouraged collaboration and knowledge-sharing among community members. Moreover, it contributed to building the confidence and economic potential of the participants through the creation of marketable art products. Overall, the activity demonstrated how community-based art development can simultaneously address environmental, educational, and economic goals.

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