

A Model of Empowering Children in Orphanages Through Zero-Waste Textile Craft: A Study in an Gunungan Surakarta Orphanage

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ABSTRACT

This community service offers a strategic solution in the form of strengthening the creative capacity of zero-waste textile craft based on upcycling industrial waste fabric scraps through collaboration with the Gunungan Surakarta Orphanage located in the industrial center area of Kampung Blangkon Potrojayan which is famous for its blangkon crafts. Kampung Blangkon Surakarta is known as a blangkon craft center that accommodates 40 active craftsmen with unique designs as a local cultural identity. However, the production process produces 25 kg of scrap fabric waste per week that has not been systematically managed and the waste is always thrown away without added value. On the other hand, craftsmen still focus on the main product blangkon without developing derivative designs based on waste, so the potential for product diversification and strengthening the creative economy based on sustainability has not been optimal. Textile waste is identified and processed into valuable craft products such as souvenirs and unique accessories through the sustainable Participatory Action Research (PAR) method, including training in knowledge of patchwork materials, craft design techniques with upcycling methods, product management and marketing strategies, as well as attractive and valuable packaging techniques. This program aims to strengthen the creativity of orphanage children by optimizing production waste management and developing a sustainable social enterprise model. The urgency of collaboration lies in creating synergy between the creative industry and social institutions in building a community-based circular economy ecosystem. With this integrated approach, this innovation is expected to increase the added value of textiles while simultaneously promoting the sustainable economic independence of orphanage groups.

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INTRODUCTION

The Potrojayan Blangkon Village, a collaborative partner, is located in Serengan District, Surakarta City, where the majority of residents are blangkon artisans. The blangkon is a head covering, a component of traditional Javanese attire (Cisara, 2019). Blangkon production not only provides a primary livelihood but also plays a role in preserving local cultural heritage. The village's existence strengthens the region's cultural identity and supports the local wisdom-based tourism sector.

The growth of the creative industry in Indonesia contributes to the local economy and employment (Rostiana & Sagara, 2017). One example is the creative industry of blangkon crafts, produced directly in Kampung Blangkon. However, the increase in garment production, such as blangkon, has also increased textile waste from scraps of fabric that have not been optimally managed. During the production process, pattern cutting produces scraps of material of various sizes that are not reused and are often considered to have no economic value. As a result, these scraps are often discarded or left around the business premises. Textile waste is categorized as solid waste that is difficult to decompose and has the potential to pollute the environment if not managed through a sustainable system (Alifa et.al., 2022; Tang, 2023). This is because scraps are characterized by being composed of synthetic fibers and a mixture of chemical dyes and finishing materials that are difficult to decompose naturally (Oliviani et.al., 2023). At the local level, the Kampung Blangkon MSMEs, as partners, often face limitations in waste management due to limited access to technology and the absence of a partnership system that integrates environmental aspects with economic productivity. Waste fabric scraps, which have the potential to be reused, are often not recognized as a valuable resource. This situation demonstrates that the textile waste problem is not only an environmental issue but also related to suboptimal production management and resource utilization.

Gunungan Orphanage, as a target partner, is a social institution that accommodates orphans, orphans, and children from underprivileged families who need care and support in education and daily life. In general, children in orphanages have limited economic access and opportunities to acquire additional skills outside of formal education. Productive and creative skill-based activities are still relatively limited, so that the development of self-potential, especially in the fields of entrepreneurship and practical skills, has not been optimally developed. Systematic management of waste rags can produce various benefits from environmental, social, and economic aspects. From an environmental perspective, textile waste from rags can be reused into craft products or functional goods that can reduce waste volume and help reduce the impact of environmental pollution due to the nature of synthetic fibers rags (Negi, 2025). From an economic aspect, patchwork that originally had no use value can be processed into valuable creative products, such as bags, accessories, and other environmentally friendly products that can create added value and open up business opportunities based on the creative industry on a household scale and are able to provide additional income opportunities for the community, especially at the Gunungan orphanage (Istiqomah, 2024).

zero-waste textile craft innovation, the development of upcycled textile patchwork-based craft products focuses not only on functional aspects but also on enhancing the visual appeal of the product by strengthening local cultural identity. Utilizing local cultural visual elements in product design can enhance aesthetic value while strengthening the competitiveness of craft products in the market (Sunarya, 2021). Collaborative spaces are a strategic solution for empowering children and adolescents in orphanages. One effective approach to improving these skills and creativity is through various training programs. Training focuses on understanding the characteristics of patchwork materials, upcycling-based craft design techniques, and efficient product management so that waste can be optimally utilized (Wati et. Al, 2025). The upcycling approach enables the transformation of textile waste into high-value products and the reduction of textile waste (Sung, 2015). In addition to technical production aspects, training also covers business management and product marketing strategies to ensure craft products are competitive. Appropriate marketing strategies, including attractive and valuable packaging techniques, have been shown to increase consumer perceptions of quality and purchase interest (Rundh, 2005). Through the integration of material understanding, upcycling technical skills, and management and marketing strategies, this program not only

contributes to the reduction of textile waste, but also encourages economic independence and social empowerment of participants in a sustainable manner.

The urgency of the collaboration program is to optimize the use of textile waste to improve the economy of MSMEs so they can compete in the market, while children in orphanages as target partners have increased capacity through technical skills in upcycling -based patchwork processing. In addition, children in orphanages also receive business management and marketing strategies as provisions for their future independence. In 2023, there were 16,822 active Child Welfare Institutions (LKSA), with 4,538 of them registered in SIK Gis. Of these, 3,561 LKSAs had orphans under their care (Directorate of Child Social Rehabilitation, 2023). Of the number of orphans in Indonesia, Central Java Province is second in terms of the number of orphanages in Indonesia after East Java with 607 orphanages (Novrizaldi, 2023).

Children in orphanages often face disparities in obtaining a quality education compared to children outside the orphanage. Several factors, such as limited resources, lack of support, and social and psychological challenges, can prevent them from receiving an equal education (Manalu et. al., 2024). Existing facilities in orphanages still have many shortcomings, because the completeness of the facilities is provided to meet more urgent needs (Rasyidi et. al., 2023). The lack of funds and available facilities results in the development of children's talents being hampered, another consequence that can occur is that children do not have talents or skills that can be used in the future. According to the Ministry of Social Affairs and UNICEF, it was revealed that orphanages function more as educational institutions, children who live in orphanages generally still have parents and are sent to continue their education, and orphanage administrators lack adequate knowledge about ideal care for children (Wigianti et. al., 2017). Therefore, children in orphanages in Indonesia on average have few skills to develop their talents outside of formal education (Sipayung et. al., 2022).

These problems were also experienced by the Gunungan Surakarta Orphanage, namely: (1) Limited knowledge of the orphanage children regarding the use of the zero waste concept based on upcycling scrap fabric into useful and saleable products, (2). The suboptimal improvement of technical skills, creativity and work readiness in the creative industry sector, and, (3). Strengthening soft skills that can support the economic independence of the orphanage children in the future.

Gunungan Surakarta Orphanage



Figure 1. Gunungan Orphanage

Gunungan Surakarta Orphanage is a social institution engaged in welfare services for abandoned children through sponsorship and development activities. This institution acts as a substitute for parents or guardians in meeting the physical, mental, and social needs of foster children, so that they have the opportunity for optimal personality development as the nation's next generation who are able to participate in national development. The presence of the orphanage is motivated by the increasing number of poor people, both in urban and rural areas, which is exacerbated by various natural disasters and limited access to education and economic opportunities. These conditions cause many children to be forced to drop out of school and lose hope of achieving a better future. As a form of social concern, on March 21, 2007 through the Gunungan Foundation, the Gunungan Surakarta Orphanage was established, located in the Kampung Blangkon Potrojayan area, precisely on Jalan Arjuna, Serengan, Surakarta (300 m to the Kampung Blangkon area).

Ironically, there is still limited knowledge and skills in utilizing waste fabric at the Gunungan Surakarta Orphanage, particularly in processing the fabric into useful and marketable products that have the potential to financially support the foster children. This condition results in the suboptimal development of practical skills, creativity, and entrepreneurial abilities that can support their future economic independence. Therefore, training on the utilization of fabric scraps based on zero waste upcycling is needed so that children not only have the technical skills to process textile waste into creative products but also gain an understanding of simple business opportunities as a provision for economic independence.

IMPLEMENTATION METHOD

This community service method uses Participatory Action Research (PAR) through a cycle. problem identification, planning, action, reflection, improvement that focuses on zero-waste textile craft innovation based on upcycling industrial waste fabric scraps for the Gunungan Surakarta Orphanage are as follows:



Figure 2. Implementation Method Flow

1. Upcycling

Material Introduction & Product Design Training

This training activity began with an introduction to the concept of zero-waste textile craft and the upcycling method as an approach to utilizing waste from the blangkon (traditional clothing) industry. Participants were given an understanding of the characteristics of the fabric, fiber types, material durability, and sorting and grouping techniques based on size, color, and texture. Next, partners were involved in exploring design potential through brainstorming creative ideas based on Surakarta's local cultural identity. The activity continued with product design practice through sketching and planning craft models that have the potential to become souvenirs and unique accessories. This includes efforts to increase innovation to improve the performance of MSMEs (Aulia & Hidayat, 2021). Through this training, participants not only understood the environmental value of textile waste management but also were able to design innovative products that have aesthetic and sales value.

2. Training and Assistance in Production and Product Branding

At this stage, partners receive training in basic patchwork craft techniques, from pattern cutting and fabric combination design, basic sewing techniques, to product finishing. The activities are conducted through hands-on practice and intensive group mentoring to ensure each participant understands the systematic production flow. In addition to the production process, participants are

also provided with an understanding of the importance of packaging as part of a strategy to increase product value. Good packaging will align with increased product sales (Rasa et al., 2023). The training includes product identity design, such as naming, labeling, and simple, attractive, and environmentally friendly packaging design. Well-packaged products are expected to improve perceived quality and consumer appeal in the market.

3. Business Management and Product Marketing Strategy Training

The final stage of the training focused on strengthening partners' entrepreneurial capacity through an introduction to simple business management and product marketing strategies. Business management encompasses marketing, finance, and human resource management (Baskoro et al., 2022). Participants were taught how to calculate the cost of goods manufactured (COGS), determine competitive selling prices, and independently maintain simple financial records. Furthermore, the training covered branding strategies, social media promotion techniques, and live product marketing simulations. The integration of knowledge enhancement, technical skill strengthening, and soft skill development formed a strong foundation for participants to optimize performance and drive business growth (Taime et al., 2024).

4. Evaluation

A comprehensive program evaluation was conducted to measure the effectiveness of the training and its impact on improving participants' knowledge, skills, and entrepreneurial readiness. The evaluation was conducted through several methods, including a pre-test and post-test to determine increased understanding of the concept of zero-waste upcycling, direct observation during production practices to assess technical skills, and product quality assessments based on neatness, creativity, function, and marketability. In addition, a simple managerial ability evaluation was conducted through simulations of calculating the cost of goods manufactured (COGS), determining selling prices, and basic financial records. Soft skills such as communication, teamwork, and problem-solving were also evaluated through observations during group work and reflective discussions at the end of the activity. The evaluation results serve as the basis for program improvements and follow-up with full partner involvement, including recommendations for strengthening mentoring, developing product variations, and sustainable marketing strategies. The evaluation stage is crucial because it relates to measuring the extent to which program participants (Fatzuarni, 2022), in this case the orphanage children, understand the training provided.

RESULTS AND DISCUSSION

Besides the advantages of establishing the Gunungan Surakarta Orphanage, there are several problems faced by partners that can be identified as follows: (1) The absence of a textile waste management system, especially patchwork fabrics, which is integrated with the potential of industry or business actors around the orphanage; (2) Limited knowledge and skills of foster children in utilizing patchwork fabrics based on zero waste upcycling into useful and marketable products; (3) Practical entrepreneurial skills and simple product management that still need to be improved to support the economic independence of foster children (4) Limited interpersonal skills and non-technical abilities (communication, teamwork, creativity, and problem solving) that support innovation in the future; and (5) The foster children's ability to identify opportunities for activities that support economic independence that are in accordance with the potential, interests, and resources of the environment around the orphanage is not yet optimal.

Several priority issues are as follows: (1) Around the orphanage there is a blangkon craft industry with 40 craftsmen. The production of scrap cloth waste per week reaches 25 kg; (2) The lack of understanding of the orphanage caretakers and children regarding the use of scrap cloth waste as a product with utility and sales value through a zero waste upcycling approach ; (3) Weak expertise in identifying and utilizing potential relevant to existing resources, especially in developing textile waste-based craft skills to support the orphanage's economic independence; (4) Children have not received adequate training related to practical craft production skills, simple entrepreneurship, and other supporting skills to encourage creativity and innovation in the future; and (5) Interpersonal and

soft skills such as communication, teamwork, and problem solving still need to be strengthened to support the readiness of foster children to face the world of work and independent life.

To overcome the problems faced by the Gunungan Surakarta Orphanage, the Pengabdian team offers solutions which are summarized in table 1.

Table 1. Problem Solutions

Priority Issues	Solution	Assets/TTG to be given to partners	Target achievement
The target partners of the Gunungan orphanage do not yet have an understanding of the use of waste fabric as a product with utility and sales value through a <i>zero-waste upcycling approach</i> .	A workshop on making crafts from scrap fabric waste using a <i>zero-waste upcycling approach</i> using the PAR method and involving orphanage children as target partners.	The foster children of the Gunungan orphanage have an understanding of the use of waste cloth scraps through a <i>zero-waste upcycling approach</i> .	Understand the concept of <i>zero waste upcycling</i> and be able to process scrap fabric waste into useful and marketable products.
Weak skills in identifying and utilizing textile waste-based craft skills to support the economic independence of the orphanage.	Training in identifying the potential of scrap fabric waste and developing craft skills based on textile waste.	Foster children of the Gunungan orphanage able to develop textile waste-based craft skills. The TTG provided will be in the form of sewing machines which will later be donated to target partners.	At least 5 types of craft products are created from scrap fabric waste.
Limited training related to practical skills in craft production, simple entrepreneurship, and other supporting skills to encourage creativity and innovation in the future.	Training in basic craft techniques, introduction to entrepreneurship, entrepreneurial management, as well as development of creativity and innovation using the PAR method and involving orphanage children as target partners.	The foster children of the Gunungan orphanage have skills in entrepreneurship, entrepreneurial management, and can develop creativity and innovation.	The formation of entrepreneurial strengthening in the form of determining selling prices and carrying out simple financial records independently.
Lack of interpersonal skills and <i>soft skills</i> such as communication, teamwork, and problem solving in foster children.	<i>Soft skills</i> development training for foster children at the Gunungan orphanage includes effective communication, teamwork, leadership, and problem solving.	The foster children at the Gunungan orphanage have <i>soft skills</i> including effective communication, teamwork, leadership, and problem solving.	There is an increase in communication skills, teamwork, and problem solving through group work practices and training evaluation.

zero-waste upcycling- based patchwork crafts, combined with entrepreneurship training and strengthening soft skills using the PAR method and involving children in the orphanage as target partners. Activities in the form of workshops, mentoring, and group simulations target improving the skills of foster children in producing a minimum of five products with sales value, establishing a simple, sustainable production system, and improving communication, teamwork, and problem-solving skills to support the orphanage's economic independence.

The Zero-Waste Textile Craft Innovation Program Based on Upcycling Industrial Waste Fabric for the Gunungan Surakarta Orphanage is an initiative that prioritizes synergy (Figure 5) between various parties to create solutions with real impact. Through a strategic collaboration between LKSA (Children's Social Welfare Institution) and LP2M UNNES (Institute for Research and Community Service of Universitas Negeri Semarang), this program combines the strengths of social and academic institutions in optimizing the utilization of textile waste while improving the skills of orphanage children. Using lectures, training, demonstrations, and hands-on practice, a participatory and collaborative approach is applied to produce upcycled craft products with market value. This synergy demonstrates the importance of cross-sector collaboration in supporting a circular economy while encouraging the sustainable economic independence of foster children.

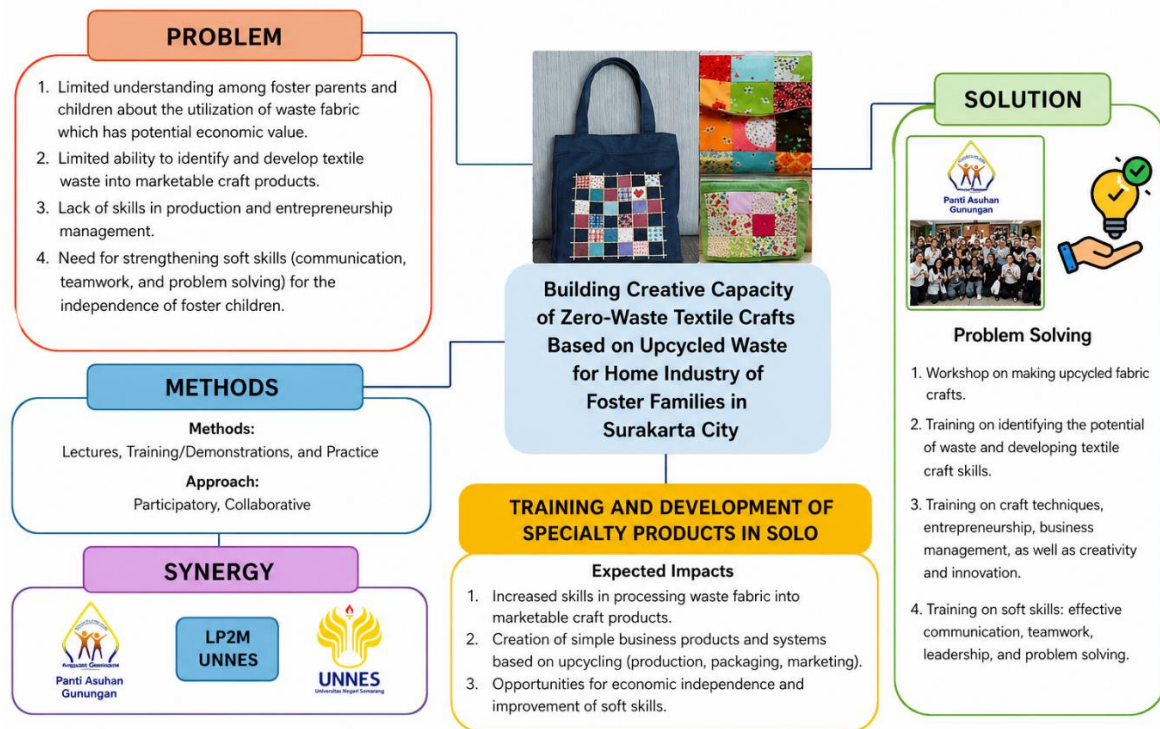


Figure 1. Flow and interrelationships between elements in community service activities, training, and implementation of waste processing results to become useful products

In addition to strengthening basic skills in patchwork processing, this program also encourages creative exploration in developing a variety of zero-waste textile craft products. This exploration is crucial because it not only enhances participants' technical skills but also expands opportunities for product diversification with market value.

The various craftworks produced demonstrate the flexible potential of patchwork fabric for both functional and decorative applications. One such product is the wrapped button, a technique of wrapping buttons using patchwork fabric in a variety of attractive patterns and colors. This product is relatively simple yet highly aesthetically pleasing and can be used as a fashion accessory or decorative element.

In addition, participants also developed products such as fabric fans, which utilize a combination of patchwork fabric as the main visual element with a simple frame. This product not only functions as a traditional cooling device but also serves as a unique souvenir with cultural value. Furthermore, bags and wallets became a main focus due to their higher economic value. During the creation process, participants learned to combine various pieces of patchwork fabric into unique patchwork designs, giving each product its own distinct character.

Another exploration was conducted into wall decoration products, such as textile-based wall hangings featuring local motifs and artistic color combinations. These products functioned as both interior decoration elements and a medium for participants' creative expression. Furthermore, several other products developed included key chains, brooches, scrunchies, tissue holders, and other small accessories with potential as souvenirs.

The diversity of these products demonstrates that the upcycling approach is not only focused on waste reduction but also opens up broad opportunities for design innovation. This exploration process also enhances the problem-solving skills, creativity, and confidence of the foster children in creating products. Thus, this activity not only produces products but also fosters an entrepreneurial mindset based on creativity and sustainability.

CONCLUSION

The Gunung Surakarta Orphanage's zero-waste textile craft empowerment program, based on upcycling industrial scrap fabric, has demonstrated positive results in enhancing participants' skills, creativity, and independence. Through the Participatory Action Research (PAR) method, participants not only gained a conceptual understanding of textile waste management but also were able to implement it into useful and marketable craft products.

Exploring various types of products, such as buttons, fans, bags, wallets, and even wall hangings, demonstrated the immense potential of patchwork to be developed into diverse creative products. This activity also contributed to the development of soft skills, such as teamwork, communication, and problem-solving, which are crucial for preparing participants for the workplace and entrepreneurship.

Overall, this program not only provides a solution to the textile waste problem but also builds a sustainable, circular economy-based empowerment model. Synergy between the creative industry sector and social institutions is key to creating a broader impact, across environmental, social, and economic dimensions. Going forward, this program has the potential to be replicated and expanded in other communities with similar characteristics to support the strengthening of a sustainable creative economy.

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