



ECO-PRINTING AS ALTERNATIVE OPPORTUNITY OF SCHOOL-BASED-MSME ENVIRONMENTALLY FRIENDLY

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Article info	ABSTRACT
Corresponding Author: Erva Elli Kristanti erva.kristini@gmail.com STIKES RS Baptis Kediri	The textile industry was one of the contributors to the highest amount of waste in the world. One of the wastes produced by the textile industry was liquid waste which came from the remains of synthetic dyes which contained several dangerous chemicals. An alternative that could be done to reduce liquid waste from synthetic dyes was to switch to using natural dyes (environmentally friendly) that came from plants. One technique that could be used to color textiles was the eco-printing technique. The eco-print technique was a process for transferring color and shape through direct contact. The eco-printing technique used materials from plant parts that contained color pigments such as leaves, flowers, bark, etc. Products produced from eco-printings could be a school-based-MSME opportunity because eco-printings had artistic value and high selling value. The research method used literature study by taking reference sources from journals. The purpose of writing this article was to describe eco-printing as a business opportunity that could be pioneered by schools as a project continually. Keywords: <i>textile waste, synthetic dyes, natural dyes, eco-printing, school-based-MSME</i>
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INTRODUCTION

The word eco-print is rarely to be heard. However, for textile industry workers this word may be something familiar. Eco means environmentally friendly while print means printing. So Eco-print can be interpreted as a technique of printing using natural dyes (environmentally friendly) and making motifs from leaves manually by sticking them until the motif appears on the fabric. Eco-printing is different from batik, where to make batik, to make a picture pattern first and these patterns tend to be the same as each other, whereas with eco-printing, the pattern really depends on the technique of arranging leaves and flowers on the fabric into a beautiful pattern. Eco-printing is a printing technique using natural fabric coloring that is quite simple but can produce unique and authentic motifs. The principle of making it is through direct contact between leaves, flowers, stems, or other plant parts that contain color pigments and certain fabric media. This technique is the result of the development of the eco-dyeing technique from nature. Indiana Flint in 2008 developed it into

an eco-printing technique. At that time, Flint attached plants that had colored pigments and attached them to cloth that had natural fibers. The biodiversity of tropical plants has resulted in a variety of unique characters from the natural imprint of these tropical plants. Eco-printing from Indonesia produces variants that are richer in shape and color, the results are even liked by consumers from abroad and have been able to be exported to Australia, the country where eco-printing started to emerge again (Aprita, 2019). Apart from Australia, Indonesian eco-printing products have also been exported to Singapore, Malaysia, America, and several other countries. This is in line with the continuing awareness of the global community in consuming and using products from green industries that are processed from upstream to downstream by paying attention to optimizing utilization and preserving nature. Eco-printing products can be produced from a school-based-MSME because eco-printings have artistic value and high selling value. Eco-printing as a business opportunity that can be pioneered by schools as a project continually.

The textile industry is one of the contributors to the highest amount of waste or rubbish in the world. One of the wastes produced by the textile industry is liquid waste in the form of residual dyes/synthetic dye liquid from the fabric dyeing process which contains several dangerous chemical substances. In fact, initially the textile coloring process used natural dyes. However, as time goes by and technology continues to develop, synthetic dyes for textiles have been discovered. The advantages of synthetic dyes are the variety of color types, guaranteed availability, easy to obtain, more practical to use, economical price, stronger coloring power and the resulting colors are bright, stable and do not fade easily. However, synthetic dyes produce hazardous waste which can cause environmental pollution such as contaminating the surrounding soil, sediment, and surface water (Yaseen & Scholz, 2018).

Some dyes can be degraded into compounds that are carcinogenic and toxic (Kant, 2012). Because of the weaknesses of synthetic dyes, people are interest in using natural dyes begin to increase. This is in line with increasing public awareness of the dangers of synthetic waste by choosing to use natural dyes to protect the environment. Natural dyes are alternative dyes that are non-toxic, renewable, and environmentally friendly. Even though synthetic dyes have replaced natural dyes, natural dyes are considered popular and are widely used in the textile industry throughout the world. In Indonesia, the use of natural dyes is also considered a cultural treasure inherited from our ancestors and its existence is still maintained, especially in the process of batik making and fashion design. In fact, the world of trade provides incentives for textile products that use natural dyes to enter certain markets at high selling prices. This opportunities or alternative can be started and early learnt in schools as a project that may become school-based-MSME.

There are several methods that can be used to dye textile materials in a natural way, one of which is using the eco-printing technique. The eco-printing technique is a process for transferring color and shape to fabric through direct contact (Flint, 2008). The eco-printing technique uses materials from plant parts that contain color pigments such as leaves, flowers, bark, etc. There are several types of methods that can be used in eco-printing: 1. Pounding technique (beaten) 2. Steaming technique (steamed).

In the eco-printing process, there are two coloring techniques, namely the iron blanket technique and the pounding technique. In the iron blanket technique, the first step is mordanting (cleaning the fabric from dirt). The mordanting process is the same as washing clothes. After that, prepare dye from natural ingredients by soaking the leaves in a vinegar

solution. This aims to maximize the coloring of the leaves. Then, once the dye is ready, spread out the cleaned cloth and attach the leaves that have been soaked in the vinegar solution. Then, roll it up with a cylindric-pipe and tie it with rope. Last stage, namely steam the cloth that has been tied for 2 hours.

In the pounding technique, the process and method of dyeing the fabric is slightly different from the iron blanket technique. The difference lies in the last two stages. The first difference is that in the iron blanket technique, rolling the cloth using cylindric-pipe to bring out the color of the leaves on the cloth, while in the pounding technique by hitting the leaves on the cloth using a wooden hammer. The second difference is that in the iron blanket technique, drying is done by steaming the fabric for 2 hours, whereas in the pounding technique the drying process is done by drying the fabric directly in the sun. Because it is made from natural materials, the fabric motifs produced will usually always be different even though usage leaves from the same plant. The colors and motifs printed on the fabric will generally have authentic characteristics depending on the geographical location of the plant it comes from. To determine whether a plant can be used as a natural dye in eco-printing or not, we can test it based on the color, water content and aroma of the plant. Water content greatly influences the success of the eco-printing process itself.

The sharp smell can be an indication that the plant can be used as a natural dye. If the plant is rubbed against a cloth and leaves a stain, the leaves have the potential to be used as a natural dye. If the leaves are soaked in hot water for 10 minutes and the water changes color, this plant also has the potential to become a natural dye.

These characteristics are found in teak leaves, eucalyptus, strawberries, guava, bitter melon, jackfruit trees, bougainvillea plants, papaya leaves, moringa leaves, fern leaves and so on. In the process of making eco-printings, not all types of fabric can be used. Only fabrics made from natural fibers can be used. This aims to facilitate the absorption of color from the leaves into the thread fibers. Some natural fibers that can be used include cotton fiber, linen fiber, and silk fiber.

Currently, many eco-printing techniques are starting to be noticed and developed. The eco-printing is a coloring technique using natural materials. The use of natural materials is related to the environment. This is what makes the eco-printing technique important. Because natural and environmental conditions are increasingly worrying, awareness of preserving the environment is increasing. This awareness has encouraged many companies to implement eco-printing in their business aspects. However, there are many advantages to using eco-printing techniques. The advantages of eco-printing can be utilized in the business world to eliminate the negative stigma about ignoring environmental sustainability.

The first advantage of eco-printing is that it is environmentally friendly. The eco-printing is very related to the environment itself. From this understanding, you can conclude that eco-printing can create environmentally friendly products. This is so that the environment can be well maintained and does not cause pollution that harms people's health. Meanwhile, for fashion businesses, using eco-printing can provide unique and attractive motifs. Because this is also related to the use of leaves, twigs, and flowers. The process of coloring and making motifs using leaves and flowers, makes eco-printing fabrics have varied motifs. Each eco-printing fabric has different motifs and colors. Even if the fabric uses the same plant. Apart from unique and interesting motifs, you can also create various motifs using this eco-printing technique. The motifs and colors of the fabric produced from the eco-

printing technique have their own characteristics, because the motifs produced are different and cannot be allegedly even though it uses the same manufacturing techniques and types of plants. The type of fabric, mordanting process and fixation also influence the result. This is what makes the eco-printing technique have high artistic value (Ulin, 2021). In Indonesia, in recent years the eco-printing technique has been redeveloped by batik craftsmen. Initially, the technique of making batik used a patterned coloring technique covered with wax (wax) on a piece of cloth. However, currently the use of batik is no longer like in ancient times which had various rules. The use of batik cloth is freer to create in any form, it can be used every day or for traveling (Dwita 2020).

Eco-print is a promising alternative business opportunity, even as a school-base-MSME in the creative sector. Especially in this digital era, which makes it easier for someone to do everything, one of which is promoting the products on social media. Social media also makes it easier for product entrepreneurs to see trends that are popular with consumers. The product business is also a business that demands creativity and innovation. The eco-printing business can be a product business option that is creative, innovative, exclusive, and different from the others. By utilizing natural resources in the surrounding environment, eco-printing products are products that are worth selling, have a high selling price and most importantly are environmentally friendly.

METHOD

The research method used a literature review by taking reference sources in the form of books, articles from international journals and national journals, etc.

RESULT AND DISCUSSION

It turns out that the eco-printing technique can not only be done using plant media, but the eco-printing technique can be done using iron waste material. This research was conducted by Pressinawangi, N and Dian (2014). Rusty iron waste is used as a color producer which also becomes a mordant in the process of dyeing natural colors on fabric. This iron waste can also produce a deep color. If seen from an economic perspective, eco-printing processing using iron waste is affordable and easy to obtain. Processing time is also short because the ecstasy and coloring process is fast and easy. The results of this research are fabric sheets and fashion products with unique, clear, elegant, and minimalist patterns (Pressinawangi & Dian, 2014).

It is felt that eco-printing engineering businesses can develop, especially in rural areas because they have natural potential, namely lots of lush trees, fertile plants and various kinds of leaves that can be used to make eco-printing products (Dwita & Sarasati, 2020). The same thing was also done during the counseling on eco-printing techniques carried out by ISI Yogyakarta for women from *Keluarga Harapan* Program group in Bangunjiwo village, Bantul. Bangunjiwo Village, Bantul is a cultural and tourist village. This training produces various products such as masks, fans, long cloth, headscarves, scarves, and clothes. The results of these products are suitable for sale. If this program continues, it could create a promising business opportunity, especially as this village is a cultural village and tourist village so it can attract tourists.

Another research was also conducted by Desi and Ulfa (2018) on one of the well-known brands in Indonesia, the strategy used by designer Ria Miranda, who was originally known

as a Muslim fashion designer using digital print techniques, switched to using eco-printing techniques to maintain the originality of her work. This strategy is also carried out to avoid plagiarism which is very easy to occur in this digital era. This eco-printing concept produces products that are personal, limited, intimate and exclusive compared to using digital prints whose results tend to be visually consistent, time efficient and can be mass produced. Apart from that, the designer wants to create a new image for his designs as well as branding as an environmentally friendly Muslim fashion designer. The materials, processes and products produced have excellence and durability in terms of quality, aesthetics, and ethics. Ria Miranda chose eco fashion as a concept and eco-printing as a technique or process for creating work so that sustainability can be achieved.

As an effort to support government programs through creative economy programs, community empowerment is also carried out in Wukirsari village, Sleman through eco-printing business training. This eco-printing business training is a business that utilizes the potential of leaf media which is expected to foster interest in entrepreneurship and improve the village economy. The media used are also unlimited, starting from the choice of fabric and natural dyes from leaves and flowers. Compared to plain/patterned fabric with digital printing, the results obtained from eco-printings are much more exclusive and seem beautiful and classy. The capital spent is not too much, so it is very suitable to be used for fashion businesses in Wukirsari village, Sleman (Tri, Warsiki & Sucahyo, 2020).

Apart from that, the village also carries out a village potential development program in the form of a variety of plants which are used to improve the skills of Aisyiyah mothers and increase family income. In this training, Aisyiyah's mothers were taught how to make batik using eco-printing techniques starting from the mordant process, production process to the fixation process. The eco-printing batik products that were made immediately sold out, indicating that the eco-printing batik products made by Aisyiyah's mothers were suitable for sale (Akif & Arni, 2018).

Utilizing natural potential that has not been carried out by village residents also encourages the holding of eco-printing training by the Community Partnership Program. This training was held in Panggungharjo village, Bantul. Another problem is also encountered in this village, namely the lack of skills to manage the natural potential of mothers with minimal income. The media used for eco-printings uses various kinds of plants, such as teak leaves, strawberries, guava, eucalyptus and many more. The program carried out is not only eco-printing training, but the women of Panggungharjo village are also taught how to make video tutorials on making eco-printings which will be uploaded on social media, and online marketing training for the eco-printing products produced. This is an effort to realize online learning about eco-printing making that can be accessed by the wider community and as an effective marketing strategy in this digital era. From the training program that has been implemented, many of the mothers who took part in the training are interested in turning eco-printing products into a business that can increase their income. The eco-printing products produced are satisfactory and suitable for sale (Endah & Berli, 2019).

From several studies, the eco-printing technique is an alternative that can be used as an environmentally friendly fashion business opportunity. Products produced using eco-printing techniques also have artistic value and high selling value. In fact, in several cities there are already groups and associations that are developing various eco-printing methods.

CONCLUSION

Eco-printing is a technique of coloring and giving motifs to fabric using natural materials such as flowers, leaves, stems, roots, or plant parts that have colored pigments. This means that eco-printing techniques can be created and innovated using any materials found in nature that have colored pigments. Judging from several studies that have been carried out, products produced using eco-printing techniques have high selling value, are environmentally friendly, unique, and exclusive. Besides that, nowadays more and more people care about the environment, so environmentally friendly products are increasingly popular. This makes eco-printing products a promising business alternative in the creative sector. Eco-printing is also an effort to create eco-fashion which reduces dangerous liquid waste produced from synthetic dyes. Seeing that textile waste is one of the highest contributors to waste in the world, there needs to be awareness among fashion entrepreneurs to realize eco-fashion by slowly changing the use of synthetic dyes to natural dyes. Seeing the success of eco-printing training carried out in several villages, it is also necessary to hold similar training in schools as a project that have natural potential. And there needs to be attention from the government to support eco-printing product businesses in several villages so that the program will continue to run sustainably and can become a source of income for the community.

BIBLIOGRAPHY

- Akif Khilmiyah & Arni Surwanti (2018). Pemberdayaan Ekonomi Aktivis Aisyiyah Melalui Pelatihan Ecoprint Ramah Lingkungan. Available online at: <https://prosiding.ums.ac.id/semnasppm/index.php/psppm/article/view/301/183>
- Aprita, A. (2019, June 16). Batik Ecoprint Karya Eri Tembus Pasar Australia. *TribunJogja.Com*. Retrieved from <https://jogja.tribunnews.com/2019/06/16/batik-ecoprint-karya-eri-tembus-pasar-australia>
- Axel Kentaro, 24 Maret 2020 <https://www.hipwee.com/list/penggunaan-teknik-ecoprint-untuk-perabotan-berbahan-kayu/>
- BTN Kutai, 02 Mei 2019 <http://ksdae.menlhk.go.id/info/5946/ecoprint-ekplorasi-keindahan-cetakan-alam.html>
- Chasanah, A. M. (2017). Batik Ecoprint, yang Sederhana Jadi Barang Mahal. Retrieved February 23, 2018, from <http://wargajogja.net/bisnis/batik-eco-print-yang-sederhana-jadi-barang-mahal.html>
- Daning Krisdianti, 13 AGUSTUS 2021 <https://wanaswara.com/mengenal-ecoprint/> Ecoprint : Teknik Mencetak pada Kain menggunakan Tumbuhan
- Desy Nurcahyanti & Ulfa Septiana (2018). Handmade Eco Print as a Strategy to Preserve the Originality of Ria Miranda's Designs in the Digital Age. *MUDRA Journal of Art and Culture* Vol. 33, No. 3, September 2018 p 395 – 400. Available online at: <https://jurnal.isi-dps.ac.id/index.php/mudra/article/view/543/280>

- Dwita Anja Asmara & Sarasati Melani (2020). Penerapan Teknik Ecoprint pada Dedaunan Menjadi Produk Bernilai Jual. Jurnal Pengabdian Seni. DOI: <https://doi.org/10.24821/jas.v1i2.4706>
- Endah Saptutyingsih, Berli Paripurna Kamiel (2019). Pemanfaatan Bahan Alami untuk Pengembangan Ecoprint dalam Mendukung Ekonomi Kreatif. Prosiding Seminar Nasional Unimus. Vol. 2 2019. Available online at : https://prosiding.unimus.ac.id/index.php/se_mnas/article/view/396/399
- Flint, I. 2008. Eco Colour. Millers Point. Murdoch Books. Available online at: https://books.google.co.id/books?printsec=frontcover&vid=ISBN9781741960792&redir_esc=y#v=onepage&q&f=false
- J. K. D.A. Yaseen & M.Scholz. 2018. Textile dye wastewater characteristics and constituents of synthetic effluents: a critical review. International Journal of Environmental Science and Technology volume 16, pages 1193–1226. Available online at: <https://doi.org/10.1007/s13762-018-2130-z>
- Kant, R. 2012. Textile Dyeing Industry an Environmental Hazard, Open Access journal Natural Science, 4(1), Article ID :17027, 5 pages, DOI: 10.4236/ns.2012.41004
- Pressinawangi Kp, Rr.Nissa & Dian Widiawati (2014). Eksplorasi Teknik Ecoprint dengan Menggunakan Limbah Besi dan Pewarna Alami untuk Produk Fashion. Jurnal Tingkat Sarjana bidang Seni rupa dan Desain. Available online at : <https://www.neliti.com/publications/242957/eksplorasi-teknik-ecoprint-dengan-menggunakan-limbah-besi-dan-pewarna-alami-unt>
- Tri Mardiana, A.Y.N. Warsiki & Sucahyo Heriningsih (2020). Community Development Training with Eco-print Training Wukirsari Village, Sleman District, Indonesia. International Journal of Computer Networks and Communications Security. VOL. 8, NO. 4, April 2020, 32– 36. Available online at: www.ijcnscs.org
- Ulin Naini & Hasmah 2021. Penciptaan Tekstil Teknik Ecoprint Dengan Memanfaatkan Tumbuhan Lokal Gorontalo. Available online at: <https://journal.isipadangpanjang.ac.id/index.php/Ekspresi>
- Upik Wahyuni, 14 Mei 2019 <https://mediacenter.slemankab.go.id/2019/05/14/batik-ecoprint-kontemporer-unik-dan-ramah-lingkungan>