Eco-Print as an Environmental-Based Art Product: A Study of Consumer Perception and Preferences

Etty Soesilowati[1], Grisvia Agustin[2], Annisau Nafiah[3]

{ettysoesilowati.fe@um.ac.id[1], grisviaagistin.fe@um.ac.id[2], annisau.nafiah.ft@um.ac.id[3]}

Universitas Negeri Malang, Malang, Jawa Timur, Indonesia[123]

Abstract. The research aims to investigate public perceptions and preferences for eco-print products. The sample for this present study was the product of AELEEN ECO CRAFT and their consumers. Furthermore, the data were estimated using percentage descriptive analysis to study consumer characteristics and product purchase decision-making processes, as well as Fishbein multi-angle analysis to describe consumer attitudes toward a product. The findings indicate that 57% of consumers choose eco-print products because of their attractive colors. In addition, approximately 41% of consumers perceived that the quality of the fabric was cold, while 43.2% argued the price was the same as the benefit. Lastly, more than 62% of customers obtain information about the product via social media. This study also revealed that quality and benefit attributes become important aspects. This study recommends that manufacturers should improve the quality, quantity, and continuity of eco-print products and inhibition maintenance since unique art products require direct contact with the wearer.

Keywords: Eco-print, Consumer Perception and Preference, Textile industry.

1 Introduction

The relationship between the textile industry and the environment has piqued the interest of academics, corporate leaders, and policymakers. This is because the textile sector is one of the leading producers of hazardous waste in the world. This liquid waste is a byproduct of a synthetic dye used in the dyeing of a garment that contains dangerous chemicals. The benefits of a synthetic dye are its diverse color range, ease of usage, and higher coloring strength, which results in a color that is bright, stable, and non-slippery. Synthetic dyes, on the other hand, generate toxic waste that can pollute the soil and surface water around them.

To address this issue, there are numerous methods for coloring fabrics with low environmental impact. The eco-print technique is a viable option for dyeing textiles with natural substances. According to a previous study, the eco-print technology is a method of transferring colors and forms to materials by direct touch. The eco-print process makes use of color pigment-containing plant parts such as leaves, flowers, and stems. Eco-printing has emerged as one of the most promising alternative business options in the fashion industry.

In Indonesia, batik craftsmen have re-developed the eco-print process in recent years. At first look, the batik technique employed a refined coloring process that was covered with candles

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on a piece of cloth. However, the use of batik fabric is no longer the same as it was in the past, when there were various laws. Batik cloth can be utilized in a variety of ways, including on a daily basis and for travel. In current digital age, when anything is possible, one of them is developing the dissociated media fashion industry. The eco-print business can be a creative, original, exclusive, and environmentally friendly fashion enterprise. Eco-print products are valuable, have a high selling price, and are environmentally friendly since they use natural materials from the surrounding area.

The main issue, however, is that eco-print products have not been mass-produced and are instead order-based. This is due to a lack of knowledge about natural-colored textiles and a lack of understanding of the process and application of natural dyes for environmental protection. As a result, there is a growing need to analyze consumer attitudes and preferences about eco-print products as ecologically responsible art products. The purpose of this study is to look at consumer preferences and perceptions of eco-print items. The purpose of this research is to look at consumer preferences and perceptions of eco-print items. This study also intends to improve the coloring process through the use of biological resources and the right application of technology, as well as to increase the value of the product through the branding and diversification of eco-print products. The findings are intended to be valuable for optimizing the use of biological resources and helping the government's green-based tourism strategies.

2 Literature Review

According to the preliminary research, several synthetic colors degrade into carcinogenic and hazardous chemicals [4]. Natural dyes, on the other hand, are non-toxic, renewable, and environmentally beneficial alternatives to dyes. Natural dyes are a cultural wealth of ancestral heritage in Indonesia that must be conserved, particularly in the process of purification and fashion design. Even the world of trade gives incentives for natural dyed textiles to join particular markets at high selling prices. This is because natural dyes are more environmentally friendly and sustainable than synthetic dyes, which can pollute and degrade ecosystems.

There are various natural ways to color fabrics as alternatives, one of them is to employ eco-print coloring processes. Eco-printing is the process of directly transferring colors and forms to cloth. The eco-print process makes use of plant parts that contain color pigments, such as leaves, flowers, stems, and so on. There are numerous eco-printing processes available: (1) the pounding technique; (2) the steaming technique; and (3) the boiling technique. The pounding technique is pounding the plant material onto the cloth to create a pattern, whereas the steaming technique entails placing the plant material onto the fabric, wrapping it up, and heating it. The boiled technique is boiling the cloth and plant material in a saucepan simultaneously.

Furthermore, despite using the same production technology and plant type, the patterns and colors of fabrics created by the eco-print technique have their own features since the patterns produced will be diverse and unpredictable. This is what distinguishes the eco-print technique as having considerable artistic value [5]. In recent years, the business of eco-print technology

has grown significantly in Indonesia, particularly in rural regions because the country has a natural potential that includes a large number of fertile trees, fertile plants, and a variety of leaves that can be utilized to manufacture eco-print products.

In Indonesia, Ria Miranda, a famous Muslim fashion designer, initially used digital printing techniques. To keep the individuality of her art, she turned to eco-print techniques [6]. Rather than employing digital printing, which results in visually consistent, time-efficient, and mass-produced products, this eco-print approach generates a product that is personal, limited, intimate, and exclusive. Furthermore, the designer wishes to rebrand themselves as an environmentally conscious Muslim fashion designer. In terms of quality, aesthetics, and ethics, the materials, techniques, and items produced have benefits and durability. Designers use eco-fashion as a concept and eco-print as a technique to create their work in order to attain sustainability.

Public empowerment was also carried out in Wukirsari, Sleman of Indonesia, as a part of an effort to assist Indonesian government programs through creative economy activities. This eco-print business training is an attempt to capitalize on the possibilities of leaf media, with the goal of increasing entrepreneurial interest and boosting the village economy. The media used is likewise limitless, ranging from fabric selection to natural coloring of leaves and flowers. When compared to plain/motivated materials printed digitally, the results from eco-print are far more exclusive, striking, and attractive. The capital invested is not excessive, making it ideal for a fashion business in the Indonesian village of Wukirsari, Sleman [7].

It turns out that the eco-print technique may be conducted not only with plant media, but also with waste iron components. When fabrics are immersed in natural dyes, rusted iron refuse is employed as a colorant and mordant. This debris has the potential to produce a concentrated color. From an economic standpoint, eco-printing with this scrap iron is inexpensive and simple to procure. Because of the quick and easy ecstasy and coloring procedures, the processing time is also short. According to the preliminary report, the usage of waste iron resources provides fabric sheets and fashion products with unique, clear, elegant, and minimalistic patterns [8].

Green talents and green jobs are required for the green economy program. The ability of a community to optimize the management and conservation of natural resources that are helpful to the production of commodities or services is referred to as green talents. Green jobs, on the other hand, are decent jobs that contribute to sustainability. Green jobs aim to maintain and restore ecosystems, increase energy and raw material efficiency, reduce waste and pollution generated during manufacturing processes, limit greenhouse gas emissions, and aid in climate change adaption. According to the International Labor Organization, new environmentally friendly jobs are mainly dependent on the implementation of sustainability in the energy industry. Today, the global market for environmentally conscious goods and services has the potential to reach US$ 1.370 billion each year.

Eco-printing techniques could be one of the options for green jobs. Eco-print is created by printing with natural resources, such as fabrics, dyes, or pattern creators. Leaves, flowers, stalks, and even branches are used as materials. It is environmentally friendly and does not pollute the water, soil, or air. As a result, the fabric created is extremely environmentally friendly. Because of its environmentally benign nature, eco-print printing is the best option. The eco-print materials are obtained by growing them in the fields surrounding the house.

Some plants, such as virgin flowers, paper flowers, and certain types of bushes and shrubs, are relatively easy to plant and grow quickly. This type of labor is not only environmentally friendly, but also long-lasting.

Because the creation of eco-print has a high economic value, it is advantageous that this product can be run independently at home with limited money. Information technology advancements can aid in the marketing of such products. Currently, the cost of an eco-print piece is fairly high. It is primarily due to the fact that this product is handmade and takes a week to be ready for sale. Eco-print goods can be used to make garments, curtains, sprayers, bags, and other items. The eco-print technique can also be taught to children and used as one of their educational resources.

Furthermore, repeating the practice will raise awareness about leaves that can be used to generate eco-prints. For example, it can detect which leaves are suited for spinning techniques and which are suitable for pounding. It can also generate work in the form of training for individuals and communities after mastering both strategies. Our skills can be recognized through service. This includes the provision of dye and other ingredients. The use of zero-waste fashion can benefit the environment as well as the corporate development process [9]. Nonetheless, customers will acquire things with features that match their preferences. As a result, the entrepreneur must pay attention to the product features that the consumer considers vital.

3 Research Method

3.1. Study Design

The current study used a positivistic approach to analyze consumers' perceptions and preferences for eco-print items as eco-friendly remembrance products. The subject of the study was the eco-print craftsman, with the consumer as the object of study. This study's factors include consumer views and preferences for eco-print items, as well as their diversification. We used primary data from surveys and interviews to acquire information on customer preferences and attitudes. A multivariance analysis was developed to anticipate the public's attitude toward the multi-attribute eco-print product.

The attributes determined in this research were based on pre-growing information from customers and product manufacturers were obtained through interviews and in-depth conversations, as well as a review of relevant past research material. The most commonly cited product qualities by consumers were regarded as the most important attribute of the eco-print product and are, thus, included as attributes to be examined in research. Furthermore, the Fishbein multi-attributes analysis was conducted by the following attributes: (1) price, (2) design, (3) material quality, (4) color quality, (5) packaging, and (6) ease of acquisition.

3.2. Sampling and Participants

Purposive sampling procedures were used in this study, which took into account whether respondents had tried or purchased the product. The current study included a total of 50 participants. The number of samples was determined based on the minimum statistical criteria that can be employed as a study design for a minimum of 30 participants. Gender, age, and occupation characteristics of respondents (see Table 1). In general, the majority of participants

were female, accounting for 88 percent of those under the age of 20. Furthermore, this study's participants included entrepreneurs (42%), students (22%), housewives (16%), civil servants (8%), private employees (8%), and others (4%).

Table 1. Demographic Profile of Participants

Category	Information	Total	Percentage (%)
Age	< 20 years	2	40
	20 – 29 years	14	28
	30 – 40 years	6	12
	> 40 years	28	56
Gender	Female	44	88
	Male	6	12
Occupation	Housewives	8	16
	Civil servants	4	8
	Private employees	4	8
	Entrepreneurs	21	42
	Students	11	22
	Others	2	4
Total		50	100

3.3 Measurement and Data Analysis

A questionnaire type was a closed and open questionnaire in which the questioner had been given answers and also given space to provide reasons. The questionnaire consistd of three parts, covering (1) the respondent's perception of the eco-print product, (2) the assessment of the respondents' interests, and (3) the evaluation of the respondent's confidence in the product. In the first part, respondents were asked to respond to the respondent's experience in purchasing the product. In the second part, respondents were asked to respond to each eco-print product attribute to obtain the respondent's interest score. Finally, respondents were asked to evaluate each product diversification attribute in order to obtain the respondent's confidence assessment score

Fishbein's percentage and multi-array descriptive analysis wass used to study consumer characteristics and the decision-making process of the eco-print product purchase. As for the Fishbein Multi-Attribute Model formula, it is as follows:

$$A_0 = \sum_{i=1}^{n} b_i \, e_i$$

Notes:

Ao = Attitude toward eco-print products
bi = The strength of consumer confidence in the attribute-*i*
ei = Consumer (interest) evaluation of attribute-*i*
n = the number of attributes the eco-print product has
i = Attributes

The *ei* variable represents an eco-print product's attribute evaluation, which is quantified on a five-point scale from very significant to not at all important. The *bi* variate indicates how strongly the consumer believes that the instant herbaceous spice processed product under consideration possesses the features listed in the questionnaire. The *bi* measuring scale has the same five-confidence scale as the *ei*. The *Ao* variable reflects the respondent's attitude toward the eco-print product attribute, which is calculated by multiplying each confidence strength score by the attribute evaluation score.

4 Result and Discussion

There are numerous elements that can influence a respondent's decision to select and purchase eco-print products. By asking three questions on the respondent's perception of the product, motivation to buy a product, and the significant features that consumers consider when buying a product, the research successfully identified respondents' consideration factors for purchasing eco-print products. Figure 1 depicts the respondents' perceptions of the color quality of the eco-print product.

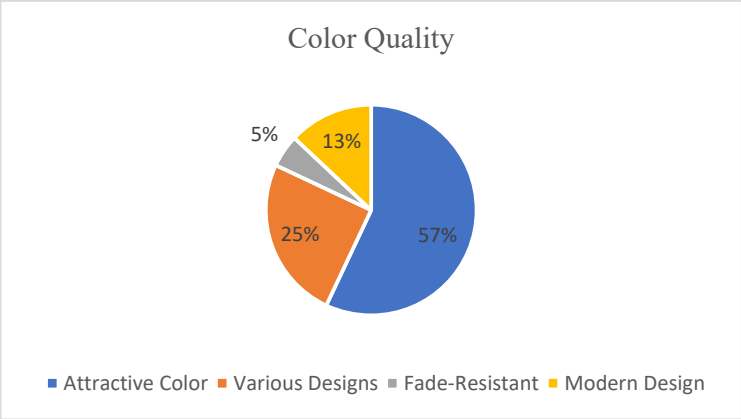

Fig. 1. Consumer perception of eco-print product color quality

Figure 1 illustrates that 57% of respondents buy eco-print products because of their attractive colors. The aesthetic value inherent in a product will provide the impression that one person's own beauty will be different from another. The aesthetic value of one of the fabric materials is determined by the elements of art. The results of the eco-print technique are unpredictable, so the beauty created can vary. The pattern of motif arrangement is random, with 124 elements of visual art. What stands out is the texture and color that are produced, as well as the other elements that accompany them, including points, lines, and fields. In the totality of motifs that are filling each other, there is a repetition of forms and colors that are not contradictory and forma totality [12].

The eco-print technique also affects the coloring results of either mori, silk, and satin materials with fixers, beads, or limestone. Research has proven that the stain or steam coloring method is more distinct in the shape of the leaf bone than the beat/pounding method. The preservative

fixator produces a brown-yellow color, a green fixator, and a blue-green limestone fixator. This confirms and is aligned with a prior study by Miftahul in 2019, which shows that the coloring results of the pounding method have color resistance [13]. Several products based on eco-print have been produced by craftsmen, including: fabrics, fashion, bags, shoes, household decorations, or souvenirs, as shown in Figure 2.

Fig. 2. Various eco-print products

Some eco-print products were printed on different types of fabrics and leather. The consumer perceptions of the quality of fabric and leather used was illustrated in Figure 3. The natural coloring process needs to be strengthened between natural colors that are already bound by fibers with metal salts, such as *Tawas* [KA1(SO4)2], limestone [Ca(OH)2], and *Tunjung* (FeSO4) [14]. The functions of the fixator, in addition to generating color, also strengthen the bond between the color uniforms, thus preventing color pigment dehydration [15]. Color resistance can be improved through a fixation process where after the dye is diffused into the solution and then absorbed, it adheres to the surface of the fiber and is then absorbed and diffused to the center of the textile fiber so that the dye is locked into the fiber. Then, fixation is required. Fixation plays a role in determining the color produced [16].

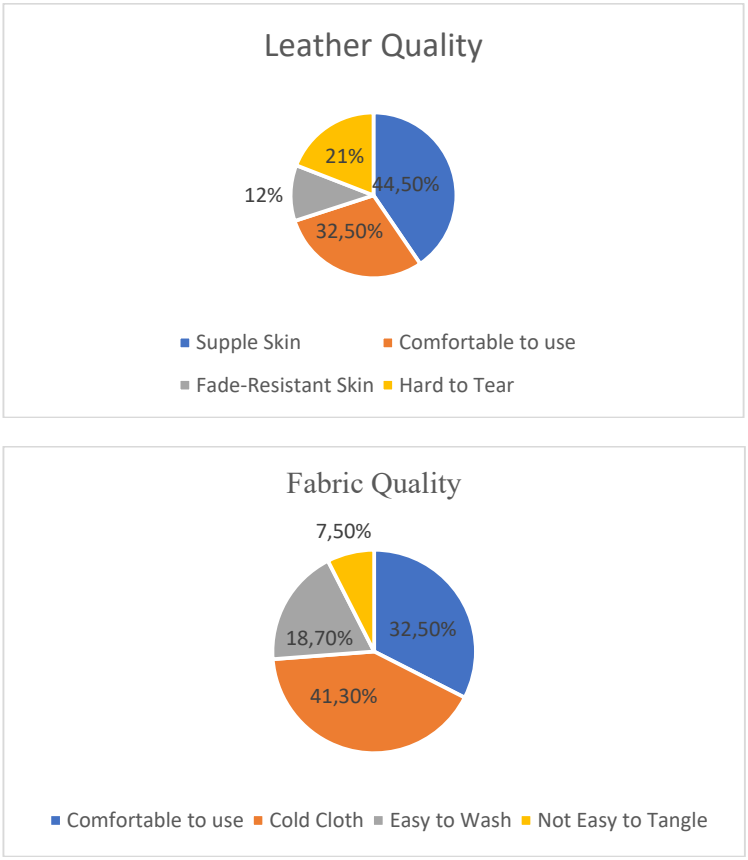

Fig. 3. Consumer perceptions of leather and fabric quality

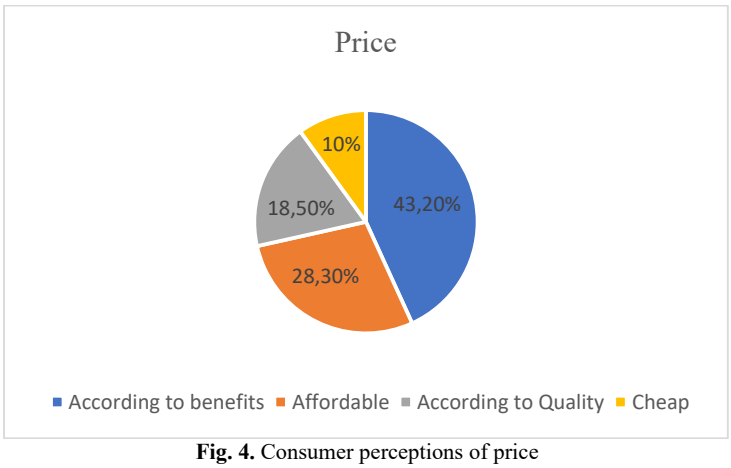

Fig. 4. Consumer perceptions of price

Figure 4 shows that people are willing to spend money when the eco-print product is purchased in accordance with its benefits and quality. Price variables have an influence on purchasing decisions for similar products. The f-value counts at 26,539 with a significant value of 0.000 < 0.05, which means the quality of the product and the price simultaneously have a significant influence on the purchase decision.

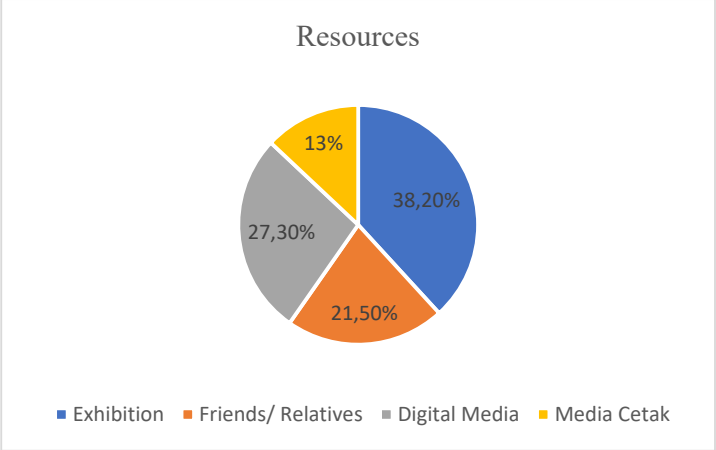

Fig. 5. Consumer information resources related to eco-print products.

As an art product with such value complexity, an artwork can have fantastic selling points beyond the estimates of common thought in valuing an object [17]. The business of art is no longer something new in today's social sphere of modern life. This is demonstrated by the role of private entrepreneurs through art galleries and art expo events, as well as the direct role of the government by forming creative economic bodies to promote business activities based on the creative works of both individuals and groups. The booming sales of artworks are characterized by an increased number and frequency of exhibitions, the growth of commercial galleries, escalate of exhibition sponsorship, and the rise of painting collectors. In addition to the increasing number of painters involved, the tremendous increase in the price of paintings, the crowding of exhibition venues (e.g., hotels, banks, and shopping malls), and a number of other symptoms (e.g., painting auctions, painting forgery, and the recirculation of old and ancient paintings).

Results of the evaluation of the interest of consumers in the attributes of price, quality, benefits, texture, and ease of obtaining the instantly processed herbal products that are the subject of research. The test results of differences between attributes showed significant differences ($p < 0.05$), indicating that consumers have different levels of interest in the attribute present in each product. The attribute with the highest rating is owned by the eco-print product benefit with a score of 4.59 and followed by a quality attribute with a rating of 4.50, respectively. Both are prominent factors for consumers in choosing eco-print products. The higher average score reflects, the more importance of the attribute give to the consumer. As an initial form of identification, an object must have an attribute or characteristic that is perceived.

Table 2. Frequency of consumer interest assessment (e_i) and test analysis differ for eco-print product attributes.

Product	Attribute	Frequency					e_i	Category	*F-statistic*	*P-value*[a]
		STP	TP	B	P	SP				
Eco-print	Price	1	35	29	20	9	3.01	Average	50.145	0.00*
	Accessibility	0	1	32	35	26	3.91	Important		
	Quality	0	0	7	33	54	4.50	Very important		
	Texture	0	2	35	41	16	3.76	Important		
	Benefit	0	0	3	33	58	4.59	Very important		

Notes: STP = Not all important; TP = Low important; B = Average; P = Important; SP = Very Important; e_i = Interest assessment score; [a] t-test with ANOVA

Inter-attribute patterns show almost the same distribution of interests, except for price attributes. Consequently, consumer interest in eco-print product attributes includes benefits, quality, ease of acquisition, texture, and price. Figure 6 shows the power of distribution of each attribute presented in the product.

Fig. 6. Attribute power distribution based on consumer interest assessment scores on each eco-print product attribute

5. Conclusion

The research aims to diversify products and empirically investigate public perceptions and preferences for eco-print products. The findings indicate that 57% of consumers choose eco-print products because of their attractive colors. Furthermore, approximately 41% of consumers perceived the quality of the fabric is cold, while 43.2% of consumers argued the price was the same as the benefit. Later, 62.5% of customers obtain information about the product via social media. The results showed that quality and benefit attributes became important. The findings recommend that manufacturers should improve the quality, quantity and continuity of eco-print products through the exploitation of Indonesian biological wealth and maintenance since unique art products require a direct contact with the wearer.

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