

AN INNOVATION OF TEXTILE SURFACE DESIGN THROUGH THE DEVELOPMENT OF BLOCK PRINTING TECHNIQUES USING MODULAR STAMP AS A STEP TO REDUCE GAS EMISSIONS IN FASHION MANUFACTURING

Ahda Yunia Sekar F

Universitas Telkom

ahdayuniasekar@telkomuniverslty.ac.id

ABSTRACT

Block printing is one of the conventional printing techniques on paper originating from China which then this technique is used to print on fabric and is growing rapidly in India. Block printing has great potential in the creative industry today, especially in fashion. The rapidly growing fashion industry offers a wide variety of innovations and variations of attractive and competitive clothing products. However, as a consequence, the fashion industry is also a major contributor to environmental pollution both air and water in the manufacturing process. This research methodology uses quantitative and qualitative approach. Quantitative data are carried out through motif experiment, and qualitative data are carried out through literature study and observation. The Modular stamp is the development of the basic block printing technique which aims to be able to make interesting motifs and provide many new motif possibilities by minimizing stamp size. In addition, the modular stamp method with the block printing approach can minimize the production of gas emissions and reduce water pollution when compared to the printing and screen printing method.

Keywords: textile surface design, block printing, modular stamp

INTRODUCTION

The History of Block Printing

Block printing or hand block printing is a technique to decorate the fabric surface with coloring paste using a wooden block by pressing repeatedly along the fabric surface area. Block printed products have their characteristics so that each product is unique and different from the others. That uniqueness is impossible to get from making motives through machines. What makes this technique unique is that the wooden blocks used are made as stamps by first being carved manually according to the desired design, which is then applied to the fabric surface manually as well. Therefore, in the process of block printing, high accuracy and sensibility of workers are needed to be able to create beautiful and unique motifs.

History records that this technique was first discovered in China at the beginning of the 3rd century and is an old technique that has existed since 2000 years ago. Also during the 4th century, it was noted that this technique was also found in Egypt and several countries in Asia which later spread to Europe. Until now this technique is more developed and known in India. In India, there are several numbers of areas that have been centres of printing block processing since the 12th century and continue to grow under to the provision of Kingdom patrons that protect these fabrics. Some of the areas that become centres of block printing crafts include Andhara Pradesh, Gujarat, Rajasthan, Madhya Pradesh, Uttar Pradhes, West

Bengal: Kolkata and Serampur. (Ganguly : 2013).

Block printing in India is divided into several types based on the materials used, designs or motifs, and coloring techniques. Based on the material, There are two types of woodblocks and metal blocks. On the wooden block, there are 2 types which are the limiting block which means and the fill block which means Commonly used wood is teak which is then carved manually according to design. While metal beams use brass material to create thinner lines and more complicated motifs than wooden blocks. This metal block making is longer and expensive but can last a long time. Based on the designs or motifs there are 3 types of printing blocks namely geometric motifs such as lines and basic shapes, such as paisley flowers and leaves, and tribes. While based on coloring techniques about 3 types, namely direct printing where the dye is applied directly to wood, the obstacle is wood or metal used to carve wax or wax used to block or cover and fabric so that it cannot be stained, and what is now is pulling out colors ie incised a chemical liquid that can print colors on the print block so that the parts that can be added are different colors from the decorative colors. (Ganguly : 2013)

Its development differs in Japan, if in India this woodblock print greatly influences fabric culture, in Japan woodblock print influences text culture as well as how this culture began in China. Around the beginning of the 8th-century woodblock print was used to reproduce writings from Buddhist texts and Chinese political philosophy. Then around the year 1500s found new literature about Japanese philosophy in the form of the woodblock print. (Muscato: 2017) Initially, this woodblock print technique was not very popular until the Edo period (1603-1868) which was then widely used to make small hand-sized scrolls or traditional books that were more affordable. The use of this technique is one of them adapted with the aim of mass production. Like one of them is for making calendars which at that time became a traditional gift that is usually given when the celebration of the new year. (Abdou: 2019)

The traditional Japanese calendar is usually accompanied by a painting, but the development of woodblock print techniques can eventually replace the painting technique on the calendar and is preferred by many people because it has unique characteristics. Therefore "woodblock print" paintings became increasingly popular in the Edo period and were known as Ukiyo-e which means "floating world". At that time people were more impressed with "paintings" which told stories about everyday life, about hobbies, and the natural or city landscape. (Muscato: 2017)

It can be understood that the development of woodblock print in these two countries is very different. In Japan, woodblock print affects the culture of writing and the medium of art. It started as a medium for documenting Japanese philosophical texts aimed at mass distribution which then continued to develop towards the art medium to replace painting techniques the traditional Japanese calendar. Until now Japan is famous for its distinctive graphic art, Ukiyo-e. In contrast to India, woodblock print greatly influences the fabric culture that has hitherto created typical fabrics of Indian block printing and also simultaneously develops areas of block printing fabric manufacturers that have their respective characteristics.

FAST FASHION INDUSTRY AND ITS BAD SIDE

The rapidly growing fashion industry offers a wide variety of innovations and variations of attractive and competitive clothing products. This rapid development then created the fast fashion industry, which is the concept of the fashion industry that leads to ready-made clothing with fast fashion changes in a certain period of time at an affordable price. To meet the market demand, of course, many must be sacrificed such as wages below the minimum salary as well as environmental pollution (Pusparisa: 2019).

According to the Boston Consulting Group, in 2015 the fashion industry consumed 79 billion cubic meters of water, released 1.715 million tons of CO₂, and produced 92 million tons of waste. (Firdhaussi: 2018). About 20% of water pollution in the world is caused by the process of dyeing and fabric processing. Not only that but the fashion industry also accounts for 10% of global carbon dioxide emissions. This figure is higher than carbon gas emissions generated from the aviation industry and the freight forwarding industry. This shows that the fashion industry will produce 50% more carbon dioxide emissions by 2030. (noname:2019)

The fast fashion industry globally produces greenhouse gases caused by the amount of energy they use in their production patterns such as manufacturing to distribution per product each year. Besides that, fast fashion products are produced in several countries that use coal as the main energy source. Even though coal is the most dangerous energy because it can produce the most carbon gas emissions. Besides that coupled with other production activities that use electrical energy such as the use of factory-scale fabric printing machines will produce more carbon dioxide. This increase in carbon dioxide emissions was attempted to be avoided in this study by re-using traditional technologies that are more environmentally friendly, namely the modular block printing technique to create a variety of innovative motifs on ready-made clothing.

DATA DESCRIPTION

This study discusses the innovation of textile surface design through the development of block printing techniques using a modular stamp as a step to reduce gas emissions in fashion manufacturing. Quantitative data is taken through motive experiments. While qualitative data is taken through literature studies and observations.

The sequence of the research process is as follows:

1. Study literature on the history of the block printing and fast fashion industry;
2. Field observation about the local sustainable fashion brand;
3. Motifs exploration.

Observation

The emergence of the negative impact of fast fashion gave birth to a new concept in the fashion industry that opposes the fast fashion industry by campaigning for sustainable fashion jargon. In this sustainable concept, the pattern behind fast fashion production is strongly opposed, one of which is the replacement of the use of material manufacturing and machine-based production with natural fabric and renewable energy. Materials such as organic cotton, linen, hemp, and ramie are recommended to be one of the main materials that support the sustainable fashion movement. This material has been investigated for the lowest impact on the environment and natural fibers such as the flax plant as basic material linen is a plant that has the highest level of carbon dioxide absorption than other plants. In this observation, the researcher uses several fashion brands that have this sustainable jargon as they branding and campaigning to find out what material they used or what kind of concept they embodied their products.

A. Sejauh Mata Memandang

This brand is inspired by Indonesian culture carries the concept of sustainability by using fabric material that is easily biodegradable such as organic cotton and

Tencel. Besides that, they also support small and medium-sized businesses by cooperating with several local workers in the production process.



Figure 1. Batik Fabric as one of Sejahu Mata Memandang's Products
Source: <http://sejahu.com/about/> (2020)

B. Sukkachita

This brand has awareness of the negative impacts of the fashion industry on the environment such as pollution of industrial waste and unfair labor costs. The background created the concept of empowering women and giving back to earth on this brand. They feel they have the responsibility to be able to prosper the lives of their workers by supporting women craft workers in areas such as Flores, Central Java, and East Java. Also beside they also use Tencel, organic cotton, and silk and indigo dyes as materials and techniques in the process of making products that they believe are environmentally safe.



Figure 2. One of Sukkachita's Products
Source: <https://www.sukkhacitta.com/> (2020)

Experiment

At this stage, creating motifs in a modular concept aim to make the smallest component of a single motif that can be assembled into a larger motif component. This modular concept is to enable the formation of a diverse set of motifs without having necessary to a larger series of motifs to reduce the use of excessive block material. With the principle of block printing that is repeating the application of printing on fabric allows the creation of a diverse set of motifs. In this experiment, the making of blocks uses waste linoleum material left over from the construction of home interior flooring. Its characteristics are softer than wood, make it easier to carve manually.

A. Sketches



Figure 3. Digital Sketches to be Applied to Linoleum

Source: Private Document (2020)

B. Test Print



Figure 4. Left-Block Stamp from Linoleum Waste, Right- Test Print Results

Source: Private Document (2020)

After the block stamp is carved according to the design, the next step is to test print on a paper to find out the quality of the stamp by checking it out if there are still certain parts that need to be gouged deeper so that the printed images have a good quality.

C. Composition Exploration

Table 1. Basic Composition

<p>Bunga and Tangkai A</p>	
<p>Bunga and Tangkai B</p>	

Table 2. Advance Composition

<p>Bunga, Tangkai B and Burung</p>	
<p>Tangkai B and bunga</p>	

Tangkai A and Bunga	
Tangkai A, Bunga and Burung	
Advance level 2	

D. Application of Motifs by Modular Compositions on Ready-Made Clothing



Figure 5. Digital Sketch of Application of Advance Composition on Blouse
Source: Private Document (2020)

E. Materialization of Design



Figure 6. Modular Block Stamp Printing on hemp Ramie Fabric
Source: Private Document (2020)



Figure 7. Final Result of Modular Block Stamp with Color Variations
Source: Private Document (2020)

CONCLUSION

From the results of the research, it can be concluded that conventional block stamp

techniques can be developed to create innovative motifs by creating modular stamps. With this modular concept, various motifs can be formed through a simple block stamp with a good composition arrangement without having to make a large scale block stamp. Making a block stamp itself requires several important steps, one of which is engraving the block stamp design on rubber (linoleum). The engraving of this design or motif will largely determine the printout. If the engraving is not neat and clean, it will leave traces of ink which will affect the quality of the printed output.

In addition to being able to make diverse motif compositions, the application of modular block stamps on fashion products can reduce gas emissions in the manufacturing process. Because this technique is a development of conventional block stamp techniques and does not require energy that produces carbon dioxide which can endanger the earth's ecosystem, so it can be a recommendation for manufacturing sustainable fashion products.

REFERENCE

"_____", 2019, How Much Do Our Wardrobes Cost to the Environment?, [online], <https://www.worldbank.org/en/news/feature/2019/09/23/costo-moda-medio-ambiente>, accessed on 10 June 2020.

"_____", All You Need to Know About Fashion & Sustainability, [online], <https://www.sustainyourstyle.org/en/home>, accessed on 10 June.

Christopher muscato, 2017, History of Wood Block Printing in Japan, [online], study.com/academy/lesson/history-of-woodblock-printing-in-japan.html, accessed on 16 July 2020.

Firdausi, 2018, Memahami Fast Fashion dan Sustainable Fashion, [online], <https://medium.com/@setali/memahami-fast-fashion-dan-sustainable-fashion-c467de1d5a2a>, accessed on 10 June 2020.

Ganguly, Debojyoti, & Amrita, 2013, A Brief Study On Block Printing Process In India, [pdf], <https://www.researchgate.net/publication/292876526>, accessed on 10 June 2020.

Kelly Richman-Abdou, 2019, The Unique Hisstory and Exquisite Aesthetic of Japan's Ethereal Woodblock Prints, [online], <https://mymodernmet.com/ukiyo-e-japanese-woodblock-prints/>, accessed on 10 June 2020.

Pusparisa, Yosepha, 2019, Kontroversi di Balik Industri "Fast Fashion", [online], <https://katadata.co.id/infografik/2019/12/15/kontroversi-di-balik-industri-fast-fashion>, accessed on 10 June 2020.