

## Developing of Knockdown Gawangan Batik Design

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### Abstract

Batik is one of the traditional fabrics from Indonesia, produced by involving various equipment such as *gawangan*. Unfortunately, previous research depicted that the design of *gawangan* was too large to be moved so that the design needs further development. The present study aimed to develop a new design of *gawangan* with knockdown design for better practicality and low cost. The study used research and development design. From the development of the *gawangan* design, the following results were obtained: materials from aluminum as lighter and longer lasting. The size of the *gawangan* design was: height 200 cm, length 150 cm, and leg width 40 cm. This *gawangan* with knockdown design was easy to move and easily stored. Ergonomically this *gawangan* could be used by worker to increase productivity. The product was more economical and aesthetics because it had other functions as to displaying batik products.

**Keywords:** batik design, development, *gawangan*, knockdown.

### Introduction

Batik is the product of a high-value artwork and becomes one of Indonesia's prides. Its development is so rapid that each region has a distinctive motif. With the growing batik businesses and higher consumers' demands, some obstacles exist to meet the market needs, especially in production sector along with the waxing and walling processes. Recently, the milling and walling processes have been still using conventional tools or, somehow, without any tools. *Gawangan* is used as a tool to hang the cloth to be further processed into batik. Usually *gawangan* is made of wood or bamboo so it is light and easy to move (Asti & Ambar, 2011).

In the process of making batik from raw materials into being ready to sell, there are several stages that should be undertaken including material preparation stage (e.g. choosing the appropriate fabric type), cleaning process of the cloth from dirt and wax on fabric fibers, drying, designing/tracing the motifs, sticking, coloring the motif, walling, covering the motif with the wax, coloring/dyeing the fabric's base, chlorinating process to eliminate the wax, and drying.

The time needed for the aforementioned sequential processes is indeed very long, start from the preparation of purchasing materials, boiling the cloth for about two hours, drying it around 4 to 5 hours, designing the motifs for about 1 hour, skilled slipping process for 3 to 5 days, coloring the decided motifs for around a day, the walling process around a day, coloring/dyeing process for about four hours, and the delivery process spending around two hours. Of the whole processes of batik production, 60% of the time and energy are just for the waxing and walling processes (Russanti, 2018). Thus, innovation in enhancing the making process needs to be more efficient in times and energy. Moreover, the opportunities to meet market needs are essential, so that the production can increase and so does the welfare of small medium enterprises. The problems faced by craftsmen in the batik making process encompassed five aspects. First, in the insertion and batik making processes,

batik is still worn less comfortably, or not good ergonomics, because the craftsmen sit on the floor to work on the batik as a result they get tired quickly. The batik making processes are carried out manually, of which are very risky (Rifa'i, 2018). Second, safety aspect for craftsmen is important because there are often hot droplets of wax to certain body parts, especially the craftsmen's hands and thighs. Third, the time needed by the craftsmen for the waxing process is three to five days. Fourth, time needed by skilled craftsmen in the walling process is one to two days. At Last, the production capacity of written batik production is still relatively low depending on the condition of the person who makes it. Two important processes are the waxing and the walling processes because the conditions of the tools are not ergonomic, yet less flexible for each craftsman so that the durability is easily reduced. Non-ergonomic working positions and postures can give negative effects on workers and the companies (Lindawati & Mulyono, 2018). Therefore, this present study aims to develop a new design of *gawangan* with knockdown design for better practically and low cost.

## Method

This study used research and development design, which is a method for developing a new product or perfecting an existing and accountable product, of which the products could be prototypes and designs (Soenarto, 2008). The present study developed a knockdown, flexible, ergonomic, and multi-functional design. The definition of knockdown referred to easily installed and removed *gawangan* so that it was easily used. Flexible and ergonomics *gawangan* was easily arranged in height according to the body's batik posture, while the multi-functional aspect of *gawangan* could be used as a batik aid used to display products.

The following steps were used to develop *gawangan*:

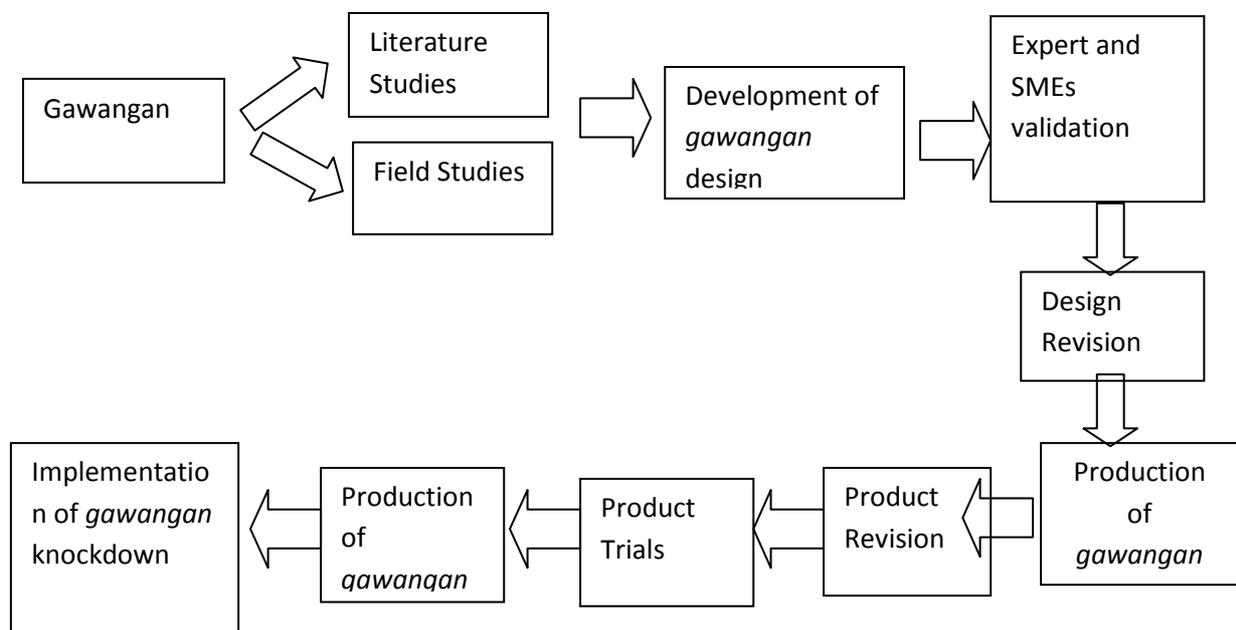


Figure 1. Step of developing *gawangan*

*Gawangan* product development began with analyzing the literature studies and the work in SMEs and batik craftsmen based on field studies. The next step was to develop the design of the product with the criteria of ergonomic and flexibility. The design was then validated by experts and small medium enterprises of Batik and, further, analyzed the shortcomings to improve the design of the product. Afterwards, the production of *gawangan* was revised for the sake of product improvements. At last, the testing of *gawangan* product was conducted for the making process of batik, of which it was carried out in small medium enterprises of batik.

## Results and Discussion

Table 1 depicts the production process of *gawangan* with different materials, sizes, functions, ergonomics, economic values, technology, and aesthetics.

Table 1. *Gawangan* Production Process

Aspects	Literature Studies	Field Study	Design Development	Development 1	Development 2
Materials	Wood	Wood, bamboo, pipe	Aluminium	Aluminium	Aluminium
Sizes	Height: 0.85m Width: 1-1.3m Leg Width: 0.2-0.3m	Not Absolute	Height: 2 m Width: 2 m Leg Width: 0.5 m No layers	Height: 2 m Width: 1.5 m Leg Width: 0.5 m Double layers	Height: 1.5 m Width: 1.5 m Leg Width: 0.4 m One layer
Functions	<i>Gawangan</i>	<i>Gawangan</i>	<i>Gawangan</i> and display	<i>Gawangan</i> and display	<i>Gawangan</i> and display
Ergonomics	Less ergonomics because the craftsmen worked on the floor and got easily tired	Not ergonomics	Ergonomics and having wheels	Ergonomics because the design considers the posture of sitting man, of which is also equipped with small chair	Ergonomics and equipped with small and higher chairs
Economic Values	Cheap but not sustainable	No economics values	Expensive but sustainable	More expensive but sustainable	Less expensive and sustainable
Technology	None	None	None	The <i>gawangan</i> could be set into different height mode and easily packed.	The knockdown is easily put off and can be set the height mode, also equipped with a tool to hang the batik cloth.
Aesthetics	Ordinary	None	More attractive	More attractive	More attractive and interesting

Based on the literature studies, the size of the height was 0.85 meters, the width was between 1 to 1.3 meters, and the size of the leg width was 0.2 to 0.3 meters. The materials used were wood and functioned as a batik stand. From the aspect of ergonomics, the product was less comfortable because the position of the craftsmen's body adjusted the product size by using a small chair or sitting on the floor. This made batik craftsmen were quickly tired and the work was less optimal. From the economic value, the price ranged from 50 to 500 thousand rupiahs, which was indeed very cheap, not durable, and easily weathered. In terms of aesthetics, the product was normal because it was only functional.

Based on the field studies, *gawangan* for small medium enterprises of batik was standardized and not ergonomics that further caused discomfort and back pain when making batik. The materials used to make *gawangan* included wood, bamboo, and pipe. Its function was only as making batik and not the others. The product had no economic value and was not durable as well as quickly broken. It had no technological and aesthetic values because it was only functional.



Figure 2. Result of Developed Gawangan with Wheels and Knockdown Model

From the results of the literature and field studies, the shortcomings were analyzed to develop a standardized design. The size of the height was 2 meters, the width of 2 meters, and the foot size of 0.5 meters. The aluminum material was functional and aesthetic as to display batik products. The expert, then, validated the design made the price more expensive. At last, the size of the design was revised especially.

The production of *gawangan* in development 1 showed the following results: the height of the *gawangan* was 2 meters and could be adjusted up and down to in accordance to the craftsman posture when making batik so that the product was more ergonomic. The width size adjusted the fabric size to a maximum of 1.5 meters and the width of 0.5 meters. The product was arranged two layers so that it could be used for more than one person when making batik. The aluminum material was to be functional and aesthetic and not only used as a *gawangan* but also a display tool. Furthermore, a hand-held trial was conducted to make batik for Batik craftsmen and SMEs.

The disadvantage was that the *gawangan* was not easily moved because it was heavy and large. From the economic value, the price was too expensive because it had two layers made of aluminum.

The production of *gawangan* in development 2 by the revision of the product in the first development showed that *gawangan* with a square structure that the height could be adjusted was equipped with clamps. The upper part of the product could be set forward or backward. The maximum size of the height was 1.5 meters, the width of 1.5 meters, and the leg width of 0.4 meters. The material was made of aluminum so that functionally it was also aesthetics and feasible to be used as a display tool.

In terms of *gawangan*, the technology was created flexibly because it could be adjusted to follow the craftsmen's posture when making batik. In addition, it also had wheels that were easy to move and could be locked so they did not move easily. *Gawangan* was created in the form of knockdown that was easy to install and remove so it made easy for storage and removal.



Figure 3. The waxing process using a hand tool

The *gawangan* was implemented by Batik craftsmen and small medium enterprises (SMEs). The results of evaluations were carried out on *gawangan* products in the initial process of 3 to 5 days or 2 to 3 days. This was due to the fact that the product developed had ergonomic values. The impact was that the production process of making batik cloth became higher.

## Conclusions

Development of *Gawangan* Batik Design is multi functions including as a *gawangan* itself and a display tool for exhibitions. *Gawangan* is ergonomic because it can adjust its height when making batik. There is a knockdown because it is easily paired and released back so that it is easy to move.

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## References

- Aliya. (2010). *Batik Pekalongan*. Jakarta Timur: CV. Rama Edukasitama.
- Asti, M., & Ambar A., B. (2011). *Warisan Adiluhung Nusantara*. Yogyakarta: ANDI.
- Depdikbud. (2013). *Pedoman Pelaksanaan Penelitian dan Pengabdian Kepada Masyarakat oleh Perguruan Tinggi (Edisi IX)*. Jakarta:Depdikbud.
- Nieman. (1999). *Elemen Mesin Jilid I*. Jakarta. Erlangga.
- Harsono & T., Okumura. (1981). *Teknologi Pengelasan Logam*. Jakarta: Pradnya Paramita.
- Hindayani. (2009). *Mengenal dan Membuat Batik*. Jakarta Selatan: Buana Cipta Pustaka.
- Hertanto, L. (2009). *Unesco Akui Batik Milik Indonesia*. Retrieved from [www.detikNews.com](http://www.detikNews.com)
- Ketut, S. (2000). *Kuliah Kerajinan Batik I*. Yogyakarta: UNY Press.
- Lindawati, M. (2018). Evaluasi Postur Kerja Pengrajin Batik Tulis Aleyya Batik Di Yogyakarta. *Jph Recode*, 1(2).
- Luhur, Surdia, T., & Shinroku. (1985). *Pengetahuan Bahan Teknik*. Jakarta. Pradnya Paramita.
- Rifa'I & Arsyad, M. (2018) *Perancangan Stasiun Kerja Pelorodan Kain Batik Dengan Metode Pei (Posture Evaluation Index) Dalam Bentuk Virtual Environment*. Surakarta: UNMUH Press.
- Russanti, I., Yulistiana, & Adiwibowo. (2018). Developing an Ergonomic and Flexible *Gawangan* Batik Design. *Advances in Social Science, Education and Humanities Research (ASSEHR)*, 112.