

Development of Textile Made From Clothing Fasteners Material Using Weaving Technique (Case Study: Cigondewah Kaler Textile Center, Bandung, Indonesia)

Annisaa Nurfitriyana^{1*}, Dian Widiawati², Bintan Titisari³

¹ Annisaa Nurfitriyana, Institut Teknologi Bandung

² Dian Widiawati, Institut Teknologi Bandung

³ Bintan Titisari, Institut Teknologi Bandung

*Corresponding author. Email: annisaa.nurfitriyana.edu@gmail.com

ABSTRACT

Cigondewah area is home to the largest textile centre in Bandung city, West Java province, Indonesia, which plays an essential role in developing the fashion industry in Bandung and Indonesia. In addition to selling textiles, in the Cigondewah Textile Center, especially in Kelurahan Cigondewah Kaler, there is also a trade area that sells clothing fasteners materials, such as zipper, webbing, buckles, shoelaces, and more. Since the COVID-19 (Coronavirus Disease-19) pandemic has spread globally, Indonesians have also felt the economic impact, including at Cigondewah Kaler Textile Center. The slowdown in trade circulation causes a decrease in traders' profits and the accumulation of goods in the shophouse area. Through a design study approach, efforts are made to find alternative solutions. The research stage begins with conducting interviews with traders and the government in Kelurahan Cigondewah Kaler to collect data related to the research. The next step by the experimental process of clothing fasteners material using the weaving technique is to create textile samples to develop craft product designs with three categories: interior, fashion, and fashion accessories. To find their general preferences of the target market of this product, the next stage is a product test for respondents who can become the potential target market, there are women aged 20-40 years old who live in various big cities in Indonesia. The test results are then interpreted as findings in this study, including the target market's tendency towards interior products, the most desirable experimental textile pattern, the preference of minimalist design choices, and suggestions for types of products that need to be developed. Through the upcycling design principle, the research aims to increase clothing fasteners value, both in aesthetic appearance, function value, and selling price, to be an indirect solution for traders in the Cigondewah Kaler Textile Center, after being economically and socially affected by the COVID -19 pandemics.

Keywords: Cigondewah Kaler, Clothing fasteners, Weaving technique, Experimentation, Upcycling

1. INTRODUCTION

At the Cigondewah Textile Center, precisely in the Kelurahan Cigondewah Kaler, there is a trade area consisting of 50 shop houses selling clothes fasteners. Clothing fasteners of fasteners are an important part of the fastening system used to hold at least two pieces of textile together. Typically, these items consist of items (e.g. buttons) that often work together with others (e.g. buttonholes). Fasteners may be permanent or temporary. Various textile

fastening accessories include zippers, webbing, buckles, shoelaces and other products [1].

Based on interviews with several traders at the Cigondewah Kaler Textile Center, the suppliers of these shophouses come from convection or factories located in Kecamatan Bandung Kulon District, Kabupaten Bandung (Ketapang), and outside Bandung such as Bekasi, Cikarang, Jakarta. Even from cities outside the province of West Java.



Figure 1 Variety of textile fastener accessories, such as zippers (1), webbing (2), shoelaces (3) and buckles (4).

The goods from these suppliers are leftovers from production and rejected exports, stored in convection warehouses or factories after a long time, then sold at much lower prices to traders at the Cigondewah Kaler Textile Center. The goods purchased by these traders are then resold in their shophouses to convection buyers, local brands, designers, individuals, and other buyers.



Figure 2 Some shops at the Cigondewah Kaler Textile Center.

In March 2020, the COVID-19 (Coronavirus Disease-19) pandemic spread globally, including in Indonesia. Coronaviruses are a group of viruses from the subfamily Orthocoronavirinae in the Coronaviridae family and the order Nidovirales. In humans, the coronavirus causes respiratory tract infections that are generally mild, such as the common cold, although some forms of the disease such as; SARS, MERS, and COVID-19 are more deadly [2].

The government has also made efforts to prevent a wider spread, including by adopting a quarantine system called PSBB (Large-Scale Social Restrictions) in early 2020 and PPKM (Enforcement of Restrictions on Community Activities) in 2021, to

break the chain of spread of COVID-19. Although many public facilities are closed, some vital sectors such as health facilities, markets, or minimarkets remain open during the PSBB. The community also supports this choice because it can prevent disease transmission and maintain people's purchasing power [2].

The impact of the spread of the COVID-19 pandemic (Coronavirus Disease-19) was also felt by traders at the Cigondewah Kaler Textile Center. Based on interviews with several traders in the area, they experienced a slowdown in trade circulation and an average turnover of around 30%, which was caused by a decrease in customer orders from their stores, which included local and convection brands. Even some of their customers were forced to close their businesses due to financial difficulties due to the economic impact of the COVID-19 pandemic. Most of their stock of merchandise is piling up, except for elastic rubber products. Elastic rubber is selling well in the era of the COVID-19 pandemic. Customers ordered it to produce cloth masks that became the best-selling products because they were needed during the COVID-19 pandemic. Meanwhile, other items, including zippers, webbing, buckles, and shoelaces, became less popular.

In addition to a decrease in orders by customers, restrictions on operating hours set by the local government on instructions from the central government, in the form of the PSBB (Large-Scale Social Restrictions) and PPKM (Enforcement of Restrictions on Community Activities) policies, intending to stop the spread of COVID-19, also affect social activities in the community trade. Operational hours have become shorter, from 09.00-16.00 WIB to 10.00-15.00 WIB. Regional quarantine makes traders adapt to survive, from offline selling in stores to online sales via social media and couriers. This was also confirmed by government officials (namely the Camat, Head of Administration, Bhabinkamtibnas, and Head of LPM Kelurahan Cigondewah Kaler) at the Kelurahan Cigondewah Kaler office during the interview session. In addition, government officials are trying to meet the needs of the local population (including traders) through vaccinations that have been carried out by 60% of the total 20,165 population and social assistance in the form of basic needs. Through this research, alternative solutions are sought through a design study approach to these problems.

Developing the clothing fasteners material in the Cigondewah Kaler Textile Center includes make the experimental of textile structure based on the

upcycling design concept, which is then responded to through a questionnaire to the potential target market. This aims to provide the attractiveness of clothing fasteners material through efforts to increase the aesthetic value, function value, and higher product selling price. In the end, development activities in processing material structures that are carried out can be an alternative solution to the economic impact of the COVID-19 pandemic in the area.

2. RESEARCH METHODOLOGY

The methods used in this research are qualitative methods and quantitative methods. The qualitative method was carried out through a descriptive data collection process through field observations at the Cigondewah Kaler Textile Center, interviews with traders in the area and government at Kelurahan Cigondewah Kaler office, then literature studies through books and journals, and looking for supporting data through the official website.

The quantitative method was carried out through the experimentation process and a survey using a questionnaire to get feedback on the experimental results.

The experimentation process is to make various alternative samples of textiles made from clothing fasteners materials manually using multiple variations of weaving techniques that are practiced by considering upcycling principles and aesthetic principles in the design process.

The experimentation process is to make various alternative samples of textiles made from clothing fasteners materials manually using multiple variations of weaving techniques that are practiced by considering upcycling principles and aesthetic principles in the design process.

3. RESULTS AND DISCUSSION

3.1. Literature Review

Cigondewah Textile Center is the largest textile trading area in Bandung city and the province of West Java, Indonesia. This area is located in three villages (villages), namely Kelurahan Cigondewah Kaler, Kelurahan Cigondewah Kidul, and Kelurahan Cigondewah Rahayu. For textile centers located in Kelurahan Cigondewah Kidul and Kelurahan Cigondewah Rahayu, the shophouses in these locations sell good quality textile per meter, per roll, or per kilogram, which are left over from production or reject export-goods. For the textile center is

located in the Cigondewah Kaler area; there are 50 shop houses selling clothing fasteners. The material is sold for the needs of making bags or clothing convection. Shophouses selling clothing fasteners are located right along the entrance to the textile center with the direction of arrival from Cijerah Main Road, namely Cigondewah Kaler Main Road. The merchant shop area is located in the area of RT 02, RW 05, Cigondewah Kaler Village, Kecamatan Bandung Kulon.

Cigondewah Kaler Textile Center has environmental conditions with sufficient road facilities to be passed by two cars (two directions). Access to enter the Cigondewah Kaler Textile Center can be via Cijerah Main Road and Holis Main Road. When you arrive, the atmosphere of the Cigondewah Kaler Textile Center from the arrival from Jalan Raya Cijerah, looks striking because the atmosphere of the roadside area is very colorful with fastening shop houses along Jalan Raya Cigondewah Kaler, displaying their products until they leave the shop and approach roadside. During the day, the road in front of the shophouse is jammed, among others, due to logistical vehicle traffic from textile factories around the Cigondewah area, to the Kopo Toll Road, or to the industrial area in Katapang, Kabupaten Bandung.



Figure 3 Traffic conditions during the day in front of the shophouse at Cigondewah Kaler Textile Center.

Until 2019, this area was crowded. After the COVID-19 pandemic spread in early 2020, this area is slowly changing. Traders comply with local government policies on instructions from the central government, in the form of regional quarantines called PSBB (Large-Scale Social Restrictions) and PPKM (Implementation of Restrictions on Community Activities), which include shorter operating hours, trading efforts from direct interaction (offline) to through social media (online), and opening stores by observing health protocols to prevent the spread of COVID-19.

The traders felt the economic impact at Cigondawah Kaler Textile Center, including most of the products being less popular. Fortunately, sales of elastic rubber for the needs of making cloth masks increased dramatically, so they were able to cover a small part of their store operations. Not only efforts to adapt the way of trading and efforts to process elastic rubber into small sizes to meet the demand for rubber for masks from customers. Creative efforts are needed to cope with the current situation. One of these creative efforts is processing merchandise in the form of less popular clothing fasteners into products that can increase their value. This is done through the introduction of clothing fasteners material and an experimental process using weaving techniques.

According to Steele [1], clothing fasteners are an essential part of the fastening system and are used to merge at least two pieces of material or fabric. Typically, these products consist of an object (such as a button) attached to another object in the textile (such as a buttonhole). Fasteners can be permanent or temporary. The principle of use that is most familiar to the public, which the principle of "put on and take off", applied to everyday clothing [1]. The clothing fasteners material that used in this study are webbing, zippers, side release buckles, sliding plastic buckles, and shoelaces.

Weaving is a versatile basic technique that functions to arrange two or more blades or planes of objects crossing each other, so that they are not separated. The stresses that occur in the overlapping planes cause high frictional forces, which ensures the shape of the webbing does not deform even when pressed [3]. The inter-plane locks that arise from the results of the pile of woven braids make the woven can be an ideal reinforcement to withstand loads and reduce deflection [4].

The weaving process is a practical and straightforward technique because it does not require special equipment and can be made using only human hands. The weaving technique consists of various types of axes and axis directions to produce multiple variations of structures. In addition, efforts to bring decorative value to woven fabrics have given birth to multiple variations of decorative techniques/patterns with various materials in weaving works. Variations in weaving techniques are determined by color, size, type of material, texture through weaving techniques [5].

In this study, the weaving technique was chosen because of the characteristics of the material consisting of various sizes, shapes, colors, and

lengths. In addition, weaving techniques are also easy to learn and practice, even without special tools, making it easy for anyone to learn.

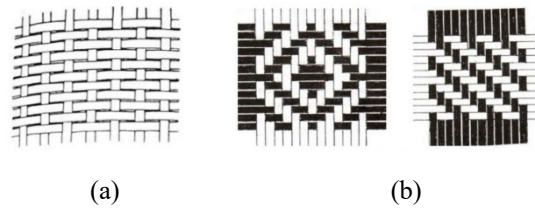


Figure 4 Some examples of types of weaving patterns. (a) Single-tight weaving; (b) Tight double cross weaving.

In this weaving technique, design theory, aesthetic principles, and upcycling principles are also considered in the experimentation process to produce several textile samples that have a higher value than when they have not been processed and reduce the long-term negative impact on the environment.

In the design process, Widagdo [6] stated that design is a cultural product resulting from changes in society, technology, economy, beliefs, behavior, and values that exist in society over a certain time. Determining the design of a craft product can be done by considering several aesthetic elements, including appearance, substance, and presentation [6].

In line with Widagdo's opinion, Djelantik [7] also expressed elements of design considerations, including:

- A. Wholeness in work, which means the relevant relationship between the individual parts without any part being completely useless.
- B. Emphasis means directing the audience's attention to a work of art to a particular thing that is considered more important than other things. The unique nature of the artwork can be achieved by using a-symmetry, a-rhythm, and contrast in its composition.
- C. A sense of balance in a work of art is the easiest thing to achieve with symmetry. Balance with symmetry provides calm, which is called symmetrical balance.
- D. Weight in work means the content or meaning of what is presented to the observer. The weight of a work of art can be captured directly through the five senses, which can be observed through the atmosphere, or ideas. The meaning received can be implied or explicit, which leads to observations to understand and live the meaning

that is intended to be displayed. On the other hand, presentation or appearance means how to present a work of art to the observer or the general public and the user community [7].

Aesthetics comes from Greek, which means *aestheta* or 'things that are felt' or objects of feeling or 'perception' and *noeta* or 'things that are known'. The concept of aesthetics has a scope of discussion that discusses issues of justice and property, behavior, experience, and value or pleasure, and its application is no longer just a matter of beauty thing [8].

Based on this definition, the design process in this study aims to apply these principles in the process of experimenting with materials and developing handicraft products. This is so that designs consisting of clothing fasteners material of various sizes, shapes, textures can become a unified and balanced unit, have attractive accents, and have good philosophical values so that the design of craft products can meet one's aesthetic needs especially the potential target market. After considering design theory and aesthetic principles, the upcycling principle is another essential consideration in experimenting with materials using weaving techniques.

Upcycling is a term popularized by Braungart & McDonough [9] or what is known as creative reuse, which means the effort to reuse old goods into new goods without having to go through the process of destruction. There is a difference between upcycling and recycling. Recycling requires a crushing step which usually requires energy (such as electricity) and more resources, and the finished product is of less quality than its original state and less environmentally friendly. In contrast, upcycling does not damage objects but is creatively reused directly. In terms of cost and opportunity, upcycling is more cost-effective and has a much more comprehensive range of uses than recycling [9].

This research was conducted by applying the principle of upcycling, with the aim that clothing fasteners material, which were initially waste products and reject export-products, after going through the design process, produce products that have more economic value, are functional, and have a long life cycle, compared to before the material was processed.

3.2. Experiment Process

The experimentation process in this research consisted of several stages, including sorting the raw

materials to be used, composing the materials and colors, and the weaving process. The following are some of the steps taken:

1. Provide wooden frames and clothing fasteners that have been sorted by color, size, texture, and minimal manufacturing defects.
2. Sort the materials according to the desired composition, then lock the materials into the warp woven frame (vertical/longitudinal) while arranging the composition on the frame.
3. Start weaving.
4. After finishing weaving, lock the weft thread (horizontally/transversely) with nails to help tighten the thread pull so that the desired weaving pattern is more symmetrical, neat, and tight.
5. After the weft is pulled, the pattern becomes tight, and the webbing is temporarily locked; to permanently lock the weave, sew the right and left ends of the weft on the warp so that the weave pattern structure doesn't shift and change.
6. Open the nails on all sides of the webbing attached to the frame (the opening process can be done with bare fingers and is safe). Then trim the ends of the webbing neatly.
7. The webbing is finished and ready to be applied to craft products.

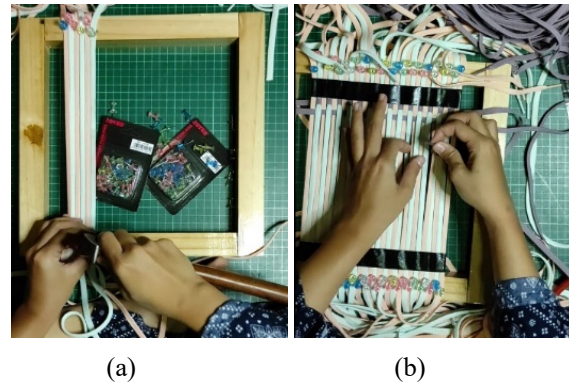


Figure 5. (a) The process of making the warp as a woven structure, which is then locked using nails; (b) The weaving process takes into account the composition by color, size, texture.

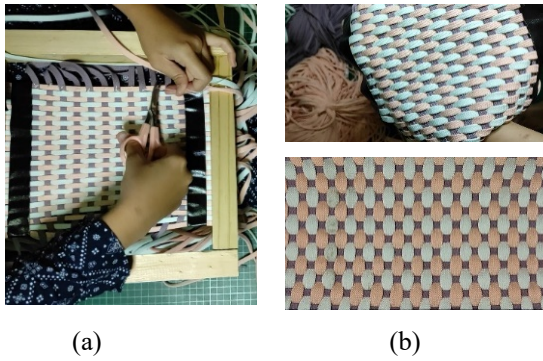


Figure 6. (a) The process of locking the woven structure by sewing on each side of the woven, so that the woven does not shift; (b) The finishing

process is by opening the nails on the frame and trimming the sides of the woven, until the woven is ready to use.

3.3. Experiment Results: Textile Sample Made From Clothing Fasteners Material

The experimental process is carried out using various weaving techniques to find the hidden potential in the material, so finally can find out the best textile sample structure and composition/patterns, resulting from the experiment. Some of the experiments carried out are shown in Table 1.

Table 1. The result of weaving pattern experimentation made from clothing fasteners material.

Table 1 The Result of Weaving Pattern Experimentation made from Clothing Fasteners Material.

No.	Woven Results	Material	No.	Woven Results	Material	No.	Woven Results	Material	No.	Woven Results	Material
1.		Shoelaces	7.		Shoelaces, semi-elastic webbing	13.		Shoelaces, semi elastic-webbing	19.		Non elastic-webbing, sliding-plastic buckle
2.		Shoelaces, iron zipper	8.		Shoelaces	14.		Shoelaces, semi elastic-webbing, non elastic-webbing	20.		Non elastic-webbing, semi elastic-webbing, sliding-plastic buckle
3.		Shoelaces, webbing, sliding - plastic buckle, plastic zippers	9.		Shoelaces	15.		Semi elastic-webbing, non elastic-webbing	21.		Non elastic-webbing, iron zipper, shoelaces
4.		Shoelaces, side release - plastic buckle	10.		Shoelaces	16.		Semi elastic-webbing, non elastic-webbing, shoelaces, side release - plastic buckle	22.		Non elastic-webbing, shoelaces
5.		Shoelace, zipper, sliding-plastic buckle	11.		Shoelaces	17.		Semi elastic-webbing, non elastic-webbing	23.		Non elastic-webbing, semi elastic-webbing
6.		Semi elastic - webbing, shoelaces, plastic zippers	12.		Shoelaces, non elastic-webbing	18.		Non elastic-webbing, semi elastic-webbing, sliding-plastic buckle	24.		Shoelaces, non elastic-webbing.

3.4. Questionnaire Results

The survey was conducted to find out the responses of respondents who have the potential to become the target market for handicraft products, resulting from experiments using clothing fasteners material and developed by weaving techniques. Participants in this survey are based on the following criteria.

A. Demographic Segmentation

Women aged 20-40 years old, with the last education between high school until doctoral degree. Their jobs include students, freelancers, designers, art directors, business people, civil servants, private employees, housewives, etc.

B. Geographic Segmentation

Domiciled in Indonesia, in big cities, such as Bandung, Cimahi, Jakarta, Depok, Palembang, etc.

C. Psychographic Segmentation

Modern women who usually doing her daily activities from 8 am – 5 pm. However, after the COVID-19 pandemic in Indonesia, the target market tends to do most of its activities at home. The target market is active on social media to get the latest information.

And here are the data obtained through questionnaires to 50 women respondents with the criteria described previously.

The process of collecting questionnaire data begins with the application of textile samples resulting from experimentation in the process of developing a craft product design, which consists of three product categories, there are interior products, fashion products, and fashion accessories products.



Figure 9. The sample of products, made by textile from experimentation. Product based on three categories, (from left to right) interior products, fashion products, and fashion accessories products.

Product samples from each category then tested by questionnaires to respondents with the aim of collecting data on respondents' perceptions and preferences. After that, then the data is processed and interpreted so that it becomes a research finding, which contains data on the most desirable designs, the most desirable patterns, the most desirable product categories, and suggestions for developing product types based on the selected categories.

3.5. Analysis of Questionnaire Results

Based on the results of the questionnaire, the following data were obtained:

1. 100% of respondents (50 women) had previously been familiar with clothing fasteners in their daily.
2. 72% of respondents know about clothing fasteners shophouses in Cigondewah before this survey.
3. However, 70% of respondents don't know before those clothing fasteners sold in Cigondewah are leftovers from production and export rejects (from convection or factory). Only 30% know about it.
4. Only 38% are interested in buying clothing fasteners from Cigondewah. While the other 56% are less interested, and another 6% are not.
5. The most popular pattern of the textile sample from experimentation is pattern no. 1 and the second is pattern no. 5 (Figure 10).

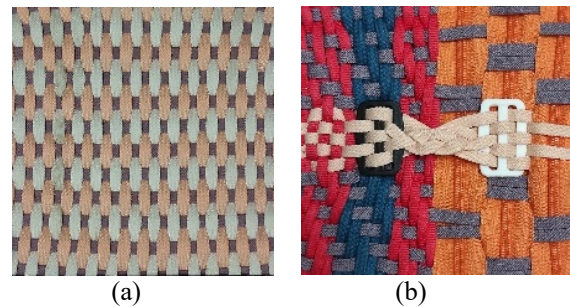


Figure 10. The most popular pattern of the textile sample from experimentation. (a) Pattern no 1; (b) Pattern no 5.

6. 27 out of 50 respondents think that the main consideration in choosing textiles is the attractive color composition. 24 out of 50 respondents think that the second consideration in choosing textiles comes from unique patterns. And 19 out of 50 respondents think that the third consideration is because the structure looks strong and sturdy.
7. Based on the survey, 68% (34 people) of respondents are interested in the interior product

category, 28% (14 people) are interested in fashion accessories, and 4% (2 people) are fashion products from all 50 respondent.

8. 65% of the total 34 respondents who are interested in the interior product category, choose this category because of its attractive (visual) design. The other 20% is due to the use of optimal materials (environmentally friendly) and the other 15% is because it can improve the mood for activities at home during quarantine from the COVID-19 (psychological) pandemic.
9. 79% of the total 34 respondents who are interested in the interior product category, have product tastes that tend to be minimalist. While the other 21% have tastes that tend to be maximalist.
10. The most desirable textile sample patterns for interior products are samples no.1 and no. 5. A total of 8 respondents chose no. 1 and 8 other respondents chose no. 5. And 16 of a total of 34 other respondents chose another textile sample patterns.
11. Based on the survey, 12 respondents suggested wall hanging products as interior product, development using clothing fasteners material with weaving technique. Then 9 respondents suggested chair products. 5 respondents suggested stool products. 3 respondents suggest any interior product is free according to researcher. 2 respondents suggested cushion products. 2 respondents suggested a tablecloth product. And 1 respondent suggested a hanger product.

4. CONCLUSIONS AND SUGGESTIONS

4.1. Conclusions

The results of experimentation and testing through questionnaires on respondents, showed that respondents who were the potential target market were interested in textile samples and the development of experimental handicraft products with weaving techniques and clothing fasteners material from the Cigondewah Kaler Textile Center. Respondents are very interested in the development of handicraft products in the interior product category, with attractive designs, minimalist tastes, with minimal pattern accents with simple techniques (see Figure 10), and handicraft products in the form of wall hangings, chairs, stools, and other products.

The data obtained is very important in an effort to increase the value of clothing fasteners material, both in terms of aesthetic appearance, function value, and

selling price, through the upcycling design principle, becoming an indirect solution for traders at the Cigondewah Kaler Textile Center, after being economically and socially impacted from the COVID-19 pandemic.

4.2. Suggestions

There is a need for further design development, by making the results of the questionnaire test as a decision consideration in the design process, and the results of the designs that have been developed need to be tested through surveys again, until they are ready to become commercial craft products.

AUTHORS' CONTRIBUTIONS

The author would like to thank for the help, guidance and cooperation of various parties who have helped in the preparation of this research. The author expresses her gratitude for:

- Dr. Dian Widiawati, S.Sn., M.Sn, is the thesis research supervisor and the head of 'KK. Craft and Tradition – FSRD ITB'
- Bintan Titisari, Ph.D., gives important inputs in this research and edits the article.

ACKNOWLEDGMENTS

The author would like to express his deepest gratitude to the "ITB Voucher Scholarship 2020-2021" for sponsoring postgraduate study and this research. The author would like to express his deepest gratitude too for all respondents who have helped fill out the questionnaire during the research.

REFERENCES

- [1] V. Steele, *Encyclopedia of Clothing and Fashion Volume-2*. Charles Scribner's Sons, 2011.
- [2] R. Nasruddin and I. Haq, "Pembatasan Sosial Berskala Besar (PSBB) dan Masyarakat Berpenghasilan Rendah," *SALAM J. Sos. dan Budaya Syar-i*, vol. 7, no. 7, 2020, doi: 10.15408/sjsbs.v7i7.15569.
- [3] H. Frick, *Ilmu Konstruksi Bangunan Bambu*. Yogyakarta: Penerbit Kanisius, 2004.
- [4] G. Anandhita, "Anyaman Bambu Sebagai Tulangan Panel Beton Pracetak," *J. Lingkungan. Binaan Indones.*, vol. 6, no. 2, pp. 130–135, 2017, doi: 10.32315/jlbi.6.2.130.
- [5] W. Yudoseputro, *Seni Kerajinan Indonesia*.

- Direktorat Pendidikan Menengah Kejuruan,
1983.
- [6] Widagdo, *Desain dan Kebudayaan*. Dirjen Pendidikan Tinggi Departemen Pendidikan Nasional, 2001.
- [7] A. A. M. Djelantik, *ESTETIKA Sebuah Pengantar*. Bandung: Masyarakat Seni Pertunjukan Indonesia, 1999.
- [8] B. Gaut, *The Routledge Companion to Aesthetics 2nd*. London: Routledge, 2005.
- [9] William McDonough. Michael Braungart., *Cradle To Cradle*, First. New York: North Point Press, 2002.