

Implementation of Design Thinking Concepts in Eco-Fashion Product Design

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Abstract

The study aims to determine how green design thinking and entrepreneurship concepts can be applied to fashion products made from recycled materials. This study uses a design thinking approach and a qualitative approach that aims to gain a deep understanding, develop theoretical foundations, and describe the reality of the research scope. The technique is in the form of collecting data from waste banks, garbage collectors, and several people who are competent in the fashion sector by conducting in-depth interviews. The combination of design thinking and green entrepreneurship can have a positive impact; problem-solving can be done through the design thinking stage to innovate in business while supporting the environmentally friendly movement. Products derived from "waste" generated by household consumption can be processed in such a way as to create selling value and be accepted by the community. Further research should consider seeking as many sources of information as possible, using appropriate tools, and studying every detail of the materials used. The findings of this study provide important insights into knowledge about design thinking and green entrepreneurship, as well as for those involved in product manufacturing. This research can also be a helpful tool in implementing knowledge about design thinking, green entrepreneurship, and the fashion sector.

Keywords—Design Thinking; Eco-Fashion; Green Entrepreneurship

Abstrak

Penelitian ini bertujuan untuk mencari tahu apakah konsep design thinking dan kewirausahaan hijau dapat di gunakan dalam menciptakan sebuah produk fesyen yang terbuat dari bahan daur ulang. Penelitian ini menggunakan pendekatan design thinking dimana di setiap tahapannya peneliti harus mewawancarai (calon) user/pengguna produk serta orang-orang yang berhubungan dengan bahan baku daur ulang, dalam hal ini, para pegawai bank sampah, pengepul sampah, dan orang-orang yang bergerak di bidang fesyen. Penelitian ini menemukan bahwa kolaborasi antara pengepul barang bekas atau sampah dengan para produsen aksesoris di industry fesyen dapat membawa dampak yang positif bagi lingkungan, sosial, dan ekonomi. Barang bekas atau sampah rumahan yang sudah tidak terpakai juga bisa dimanfaatkan kembali dan memiliki nilai jual. Hasil penelitian ini juga menekankan bahwa penggunaan konsep design thinking dapat sangat membantu proses pembuatan design produk, terlebih lagi produk yang ramah lingkungan berbahan baku sampah daur ulang.

Kata kunci— Design Thinking; Eco-Fashion; Green Entrepreneurship

I. INTRODUCTION

Various environmentally friendly products are still being developed to aid the conservation movement. The fashion industry still needs to be developed in line with changing trends, so innovations are always needed to ensure that the fashion sector does not negatively impact the environment. The fashion industry has undergone numerous changes in recent years, with the start of a new year signaling the beginning of a new fashion trend. Some have not only changed their style or color, but many brands and products are already implementing eco-fashion trends.

Article info

Received (14/10/2022)

Revised (24/10/2023)

Accepted (30/11/2023)

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DOI: 10.25124/jmi.v23i3.5486

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Eco-fashion, also known as sustainable fashion, has been discussed for some time. Sustainable fashion, according to Amanda Zahra on the Zero Waste Indonesia page, is a fashion practice that emphasizes the values of the various parties involved, particularly the environment and humanity. How to make fashion, in whatever form it takes, from personal lifestyle to business, prosper while minimizing losses (Zahra, n.d.).

The fashion industry includes more than just clothing such as shirts and pants; there are also accessory products that can improve one's fashion appearance. Hats, glasses, bracelets, necklaces, and earrings are examples of accessories. Earrings are a type of accessory typically made of gold or silver and are often referred to as jewelry. It is possible that this eco-fashion trend can be applied to fashion products, such as earrings; however, to design these products, the concept of design thinking must be implemented.

The concept of design thinking is often implemented in several business sectors because it has a structured and easy-to-understand process. Previous research has combined the concept of design thinking with various industries, such as the fashion industry for developing modern kebaya products (Silva, 2021) and the food industry for developing food products (Baskoro & Haq, 2020).

It can be seen that the implementation of design thinking has a close relationship with the concept of entrepreneurship. According to Danil (2021), design thinking has been beneficial in creating innovative ideas and creativity in entrepreneurship learning. Val et al. (2019) also argued that the research based on the concept of design thinking appears to be a powerful approach to promoting entrepreneurial skills.

From the background and explanation above, it is known that the concept of design thinking has indeed been implemented in several industries and research related to the concept of entrepreneurship. However, there have not been many studies that also incorporate the concept of green entrepreneurship, so the formulation of the problem, namely the concept of design thinking, has not been accompanied by the concept of green entrepreneurship, and as is well known that most fashion products are often made of new materials. According to the formulation of the problem presented earlier, it is common knowledge that the concept of environmentally conscious business has not accompanied the concept of design thinking. Therefore, the primary research question addressed in this study is how can design thinking concepts be used to develop an eco-friendly fashion product?

Based on the previous explanation, the main objective of this research is to find out how the concepts of design thinking and green entrepreneurship can be applied to fashion products made from recycled materials. It is hoped that the results of this research will be able to contribute in terms of science through the results of research that has been carried out on the application and development of the concept of design thinking in the field of green entrepreneurship science for future research. And practically, the researcher hopes this research can be a valuable tool in implementing research knowledge about design thinking, green entrepreneurship, and the fashion sector for business actors, environmental activists, or local MSME services.

II. LITERATURE REVIEW

Design Thinking

According to Tim Brown, CEO of IDEO, design thinking is defined as "a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity." According to Stanford University (2016), the design thinking process has five stages, which are define problem, need-finding & synthesis, ideate, prototype and test (Brenner & Uebernickel, 2016). The first stage is to determine the problem, which is about the challenges that are found or faced. Challenges describe a problem that must be solved. In formulating challenges, a good mix of focus and space is needed for innovation. The second stage is to reveal user needs. User needs are divided into evident and hidden needs, where the apparent needs will be obtained directly from interviews with the user. In contrast, the team must define the hidden needs to provide innovative and competitive solutions. The interview process is not only for users but for experts in related fields, literature studies, and searches through websites to reach the level of knowledge required to provide valuable results. The third stage is finding ideas and solutions through brainstorming. The brainstorming process needs to be carried out so that the solutions obtained can be imagined based on the previous stages and will be by user needs. There are a variety of different brainstorming methods so that any method can be used according to the team's needs, The fourth stage is to make a prototype that the user will test at the next stage. The prototype made is the result of the design thinking process from the previous stage, so it is adjusted to the user's needs. There should be more than two prototypes made so that it is easier for users to give an assessment. While the last stage is to test the prototype made for the user. It is essential to ask the user's opinion and experience when using or trying an existing prototype, as well as comments on the advantages and disadvantages of the prototype. The results of this trial phase can be used as material for evaluation and return to the first stage, which is defining the problem. Product development will be completed at the prototype

stage and re-tested for the user. Implementing the design thinking concept can produce a more focused problem formulation than the previous formulation so that the resulting solution is more relevant and has several alternatives (Ardian & Werdhaningsih, 2018).

Green Entrepreneurship

Green entrepreneurship, also known as ecopreneurship, is derived from ecology and entrepreneurship. According to Edufun-Literacy (2020), green entrepreneurship is creating and selling environmentally friendly goods and services, such as organic food, recycling initiatives, and green construction. The concept of green entrepreneurship is founded on three pillars: innovation, concern for the environment, and long-term sustainability (Garcia, Garcia, & Castillo, 2019). According to prior research, green entrepreneurship is believed to support environmental conservation programs and maintain environmental balance by implementing ecopreneur's behavior that seeks to maintain environmental sustainability and ecosystem balance (Gunawan & Dhewanto, 2012). It was also discovered that female entrepreneurs are perceived to be more motivated to practice green entrepreneurship in terms of their personal, ecological, and social values, as well as their families, than male entrepreneurs (Gunawan, Riel, & Essers, 2020).

Several fashion brands in Indonesia engage in green entrepreneurship to support the environmentally conscious movement. The majority of entrepreneurs in Indonesia can be categorized as social and eco-entrepreneurs. However, some are driven by a desire for high economic profits (Gunawan, 2013). However, a separate study found that ecopreneurs in Indonesia are motivated by three values: self-improvement, conservation, and self-transcendence. The collectivist nature of Indonesian society may account for the absence of change-readiness among ecopreneurs in Indonesia (Gunawan, Riel, & Essers, 2020)

Sare Studio by Cempaka Asriani and Putri Amandewi is a brand engaged in green entrepreneurship; they use environmentally friendly materials derived from wood and have received certification from the EU Ecolabel because they meet environmental standards throughout their life cycle. This results from a collaboration between Sare Studio and an Austrian green fiber producer named Lenzing. Another well-known brand is Wilsen William which is still working with the manufacturer Lenzing. He makes clothes from biodegradable materials made from paper pulp with environmentally friendly products. Then, unlike the previous brands, Sukkha Citta supports the environmentally friendly movement through Indonesia's first natural clothing dyeing process. He also utilizes and empowers chemical-free materials from local farming communities (Nadya, 2021).

Currently, the sustainability of a business is not only intended to get the maximum profit, but several aspects must also be considered, one of which is the environment, especially the environment in which the company is established and operates. Environmentally friendly behavior in business may have been neglected in the past because many businesses still contribute to waste from time to time, especially in packaging made from plastic that is not easy to decompose. Environmentally friendly behavior in business can be divided into three categories, namely: The production process uses basic materials derived from the environment or recycled materials, The use of biodegradable or recyclable product packaging, and the result of using the product does not cause water, soil, or air pollution.

Establishing an environmentally friendly business has the main objective of reducing negative environmental impacts and conserving natural resources. Nevertheless, it is not just about saving the earth. Some of the advantages of applying environmentally friendly concepts to business (Admin, n.d.) includes reducing the company's budget if the production process is carried out using basic materials derived from recycled materials, improving brand image and company excellence, increasing productivity by implementing business practices that support the sustainability movement, hiring high-quality employees, and creating a healthier work environment by implementing the concept of sustainability. This increases the likelihood that employees will feel happier and healthier when performing their jobs.

Moreover, Alvarez-Risco et al. (2021) show outcomes that green entrepreneurial intention positively influenced by entrepreneurial self-efficacy, where entrepreneurial self-efficacy also getting affected by four variables which is education development support, institutional support, and country support. The four variables can successfully carry out green entrepreneurship. In this case, they will serve universities to implement strategic plans to achieve their ecological ventures and develop such ventures on campus with the students that have the necessary skills.

Another study talked about sustainable entrepreneurship of food industry shown that there are four factors about the role of media availability that may developing sustainable entrepreneurship of food industry. Based on the most influential ranking, the factors are access to the internet, production process and the environment, price

satisfaction, excellent functional quality of the brand, personal attributes of customers' care and packaging quality (Yakubu et al., 2022). Although this study talks about the fashion industry, there may be similarities regarding media factors that can influence the development of sustainable entrepreneurship.

Besides that, there is also a study about an entrepreneurial ecosystem in rural areas. The results of this study found that rural poverty, natural resources endowment, peripheral location, and rural cultural values are the four important features of rurality which influences entrepreneurial ecosystems' performance in several ways. But the four features of rurality are yet to be embedded into current general entrepreneurial ecosystem frameworks as they have the potential to enhance models' capacity to capture local aspects when employed to understand and measure entrepreneurship in rural contexts (Aguilar, 2021). Although this study was not carried out specifically in rural areas, but then four important rural features that affect the performance of the entrepreneurial ecosystem can be tried to be implemented to determine their effect.

According to research conducted by Doyle and Perez-Alaniz (2017), sustainability has a concept related to competitiveness, where economic, social and environmental elements are intertwined with each other. The concept of sustainable competitiveness must be measured for separate aspects of sustainable development across a range of countries. The Sustainability Adjusted Global Competitiveness Index (SGCI), which comprehensively measures cross-country sustainable competitiveness, is identified as a credible synthetic metric. From there we know that the concept of sustainability should have benchmarks related to its success.

The green entrepreneurship concept inseparable from its entrepreneurship concept, where Dyduch (2020) in its research posited that the value of innovation is created in the early phase of the entrepreneurial process, by experimenting with new, useful and valuable ideas. The research also indicates that the nature of entrepreneurial strategy supporting value creation boils down to four dimensions: strategic innovativeness, strategic entrepreneurship, strategic leadership, and creative design of the organization.

III. RESEARCH METHODOLOGY

This study employs both design thinking and a qualitative approach to gain a thorough understanding, develop theoretical foundations, and describe the reality of the research scope. The technique is in the form of collecting data from waste banks, garbage collectors, and several people who are competent in the fashion sector. The sample was chosen using specific criteria, the first of which were individuals who understand or work with the scope of waste, such as employees from waste banks or waste collectors because they have knowledge and experience with waste processing and other waste-related issues. The second type of person is knowledgeable about current and past fashion trends.

Data was collected through direct interviews, which were conducted by visiting related parties and having face-to-face conversations, and indirect interviews, which were conducted through online platforms. Interviews were conducted in stages over three weeks on weekdays, with an average interview duration of ten minutes per individual. Photographs, voice recordings, and personal recordings were used as documentation techniques for interview activities. Constraints faced during the data collection process included 5 out of 10 interview activities that were carried out indirectly so that the interviewer could see the participant's body gestures directly from head to toe, as well as the surrounding conditions such as the state of the waste bank and what activities were carried out.

To gather preliminary data, the researchers observed waste banks, garbage collectors, and several fashion industry experts at this stage. Furthermore, structured interviews with users in person and via social networking channels were conducted. Data was processed using content analysis techniques. Content analysis is a research technique that employs a series of procedures to draw valid conclusions from texts (Weber, 1994:9). The processed data includes audio recordings, photographic evidence, and handwritten notes. Data processing aims to describe the characteristics of a message from various audiences. Table 1 shows that the proportion of respondents in this study were six male and four female respondents, ranging in age from twenty-two (22 years) to forty-two (42 years) and living in several cities in Java.

Table 1. Characteristics of the research sample

No	Name	Age (years)	Gender	Origin	Industry
1	Nur	25	Male	Bandung	Waste bank
2	Numi	22	Female	South Jakarta	Fashion

3	Sarwan	27	Male	Depok	Waste bank
4	Maya	40	Female	Bandung	Waste bank
5	Rahman	35	Male	Depok	Waste bank
6	Rosa	22	Female	South Jakarta	Fashion
7	Asep	26	Male	Bandung	Waste bank
8	Agus	27	Male	Majalengka	Waste bank
9	Florentina	42	Female	Salatiga	Waste bank
10	Tono	32	Male	Depok	Waste bank

Source: Authors data.

IV. RESULT AND DISCUSSION

Empathize (Need finding & Synthesis)

As shown in Table 1, interviews and observations were conducted with ten participants who worked for waste banks, garbage collectors, and fashion experts. Based on the findings of the interviews, several interesting quotes can be identified for each theme and category, as shown in Table 2.

Table 2. Result Interview

No.	Quotation	Theme	Category
1	"Innovation of products other than processed goods other than those produced by large factories" (Nur Jati, 25 years old, male)	New Product	New product innovation
2	"New product innovation from plastic processing" (Maya Sudarwan, 40 years old, female)		
3	"Try to continue to develop it, collect data on waste, try to process other waste again so that the value of the product provided is better" (Rosa, 25 years, Female)		
4	"New product innovation which everyone can be involved in" (Asep, 26 years old, Male)		
5	"Waste processing is only limited to plastic pellets" (Maya, 40 years old, female)		
6	"Solutions for waste have not been fully tackled" (Asep Sumarwan, 26 years old, male)	Idea Limitations	
7	"Waste is only processed into plastic pellets" (Sarwan, 27 years old, male)		
8	"Waste processing is only limited to plastic pellets" (Asep, 26 years old, male)		
9	"There should be more innovation in finished products using plastic that is rarely processed" (Tono, 32 years old, male)		
10	"There is a stimulus such as knowledge/money so that the management can process waste into something valuable that can be sold and earn money" (Florentina, 42 years old, female)		
11	"(Lack of) Public awareness level" (Agus, 27 years, Male)	Community outreach	Environmental issues
12	"More often sorting (waste) from the source" (Nur, 25 years, Male)		
13	"There is no socialization of sustainable development (about waste)" (Florentina, 42 years old, female)		
14	"Plastic must be selected and sorted for recycling" (Sarwan, 27 years, Male)		
15	"There is a trash incinerator in every house" (Agus, 27 years old, male)	Limited facilities	Government assistance / related parties
16	"There are some plastics that are usually rejected, not accepted because they do not meet the factory criteria" (Tono, 32 years old, Male)		

17	"It will run smoothly if you introduce it to the community well" (Nurma, 22 years old, female)		
18	"Marketing is critical but again no matter how good the marketing offered is, if the product does not satisfy the customer, what do you do, number 1 rules the product must be good" (Rosa, 25 years old, female)	Marketing strategy	Marketing
19	"The product must be okay, it must sell according to the predict, the product photo must sell, and the message must arrive, the marketing must be able to tell" (Nurma, 22 years, female)	Product Concentration	Product

Source: Authors data based on interview.

Where each category is explained in detail as follows:

- New product innovation: applies to all aspects of product development, from creating new products to emerging new ideas that result in product innovation.
- Environmental issues: applies to all aspects of society that contribute to environmental protection.
- Government assistance/relevant parties: applies to all aspects of the government's/relevant parties support for waste-related solutions.
- Marketing: encompasses all aspects of marketing and information distribution for the product to be known and accepted by the larger community.
- Product: encompasses all aspects of existing product optimization.

Define (Define the Problem)

Based on the table of interview results, 5 out of 6 issues are important and exciting to be discussed further. Then enter the evaluation stage, which defines some of the main points. The first point is learnings, related to the memory of what was most prominent during conversations or observations during interview activities. The second point themes, which are determined after conducting interviews directly or indirectly into categories, are the main news for groups of similar things. The third point is insight, which is a concise expression of what has been learned from the interview; the participants offer a new perspective even though it is not discovery and provides relevant inspiration to the challenge. The fourth point is "how might we" This question is the starting point for an idea development session, written in direct response to an insight. The last point is ideas, ideas generated during a brainstorming session can be efficient and straightforward or out of the ordinary because the goal is to generate as many ideas as possible; ideas are best communicated with a quick sketch.

The chosen problem concerns the lack of product innovation in processed plastic waste. Based on the interview results, it is known that the plastic waste purchased by the factory is only processed into plastic pellets as before and is required in large quantities or on a large scale. Plastic waste can also be processed into handicrafts such as water-gallon lidded bags that come from coffee packs woven manually and take a long time to become a product and have a selling value. However, there is still little public interest in buying it due to the quality that does not meet standards. So, it is necessary to innovate new products with new processing methods to create high-quality plastic waste processing products suitable for sale and in demand by many people of various ages. Therefore, the solution that can be offered is to establish a business that can process waste, especially plastic bottles, into high-quality accessories so that the product has a selling value and supports the movement of recycling plastic waste that is difficult to decompose.

Ideate

Brainstorming activities are used to generate new ideas; there are various methods of brainstorming, each with its function and outcome. In this study, the brainstorming activity was carried out by selecting one of five topics from the previous stage, namely the define stage. The learning chosen is "try to continue to develop it, collect data about waste, try to process other waste so that the value of the product provided is better, with the theme of new product innovation." Then came the realization that "plastic bottle caps are only reprocessed into plastic seeds that can only be sold to factories." Furthermore, the formulation of how we might "convert plastic bottle cap waste into another valuable and high-quality product that the larger community can accept." The ideas are organized according to the theme category after the creation of new ideas. Most ideas are in the category of product innovation, explicitly using all parts of the bottle rather than just the cap, creating zero waste products, creating products in other fields such as cutting boards and bowls, and creating products that are no longer visible

in the form of essential ingredients, creating products that have value functions that are more like plates or glasses, and using less frequently used trash.

Prototype



Fig. 1. Prototype 1

Source: Authors.

The prototypes made from plastic bottle caps for beverage packaging are processed to be of high quality and marketable. This product requires the preparation of several tools and materials. The required equipment consists of heat-resistant gloves, knives, scissors, an iron, and pliers. In addition to the required materials, plastic bottle caps, baking paper, wire, earring hooks, sandpaper, lighters, and clear spray paint are also required. After gathering all the tools and materials, place the baking paper on the floor, place the plastic bottle caps on it, and fold the baking paper to cover the entire surface. If the iron is hot, place it on the baking paper and wait until the plastic bottle cap has melted and combined. Knife-cut a rectangular pattern for the first rectangular prototype. If the pattern has already been established, trim it with scissors. Because the basic shape of the plastic bottle cap is a circle, a circle will be formed automatically for the second prototype. Knife-cut a semicircle pattern for the third semicircle prototype. If the pattern has already been established, trim it with scissors. Next, sand the front and back of the earrings to create a smoother and more uniform surface. Then, coat the exterior of the earrings with clear spray paint and wait for it to dry. Then, heat the end of the wire with a match and create a hole in the earring's top while the wire is still hot. Insert the second wire into the hole, then use pliers to shape it. In addition, insert the earring hook and cut it with pliers. The initial, second, and third prototypes are prepared for testing.

After evaluating with the team, we got several product developments as a result of the evaluation, namely: Create designs with more diverse colors and shapes and create a smoother earring texture. The evaluation result from the previous prototype is shown in Figure 2.



Fig. 2. Prototype 2

Source: Authors.

Testing

After product development based on the team's evaluation, the five products were tested on ten users—the results and responses as shown in Table 3.

Table 3. Participants Testing Result

No.	Quotation	Innovation Category
1	"There is still a lot that can be improved from this product; perhaps you can find a better supplier of iron earrings; the color combination is good; well, maybe try looking for a more unusual shape to make it more interesting; it is still too basic, but for the price, you can adjust it to your liking." "How effective is your campaign?" (Alia, 25 years old, female)	Product development and price recommendations
2	"It is good, and the colors are not boring either, but maybe the artistry can still be improved, I already like the shape, and maybe it can be sold for 20-50 thousand, depending on the packaging as well." (Tarisa, 19 years old, Female)	
3	"I prefer the black and white one because the color combination is perfect, it is not too exaggerated, and it appears that the black and white one is thicker. As long as you sell it for 20 thousand, it is already good." (Da'watul, 21 years old, female)	Price recommendations
4	"I like two of them, but the black and white one is better because it goes with any outfit other than the basic color, and the shape is also more basic than the blue-yellow one. If the price is 30 thousand, it can still sell well and should be in the market." (Aisyah, 20 years old, female)	
5	"The product is already pretty good; the important thing is that you are smart in managing your business so that your campaign is conveyed; if there is a price problem, you can adjust it to your campaign 50-100k; it is still okay if the campaign is clear and can be conveyed well." (Della, 22 years old, female)	Business management and price recommendations
6	"I like the color combination because it is unusual and attractive, but the product surface is still not smooth." (Sandra, 21 years old, female)	Product development
7	"I like the shape because it looks elegant, but not the color because I do not think it complements the product's elegant shape, so maybe you can choose another color that looks more elegant." (Deska, 24 years old, female)	
8	"The shape is unique because when you put it together, it makes a full circle, and when you wear it, it looks like a watermelon. Maybe you could add a motif to the earrings to make the shape even more unique." (Asep, 20 years, Perempuan)	
9	"I like the simple shape because it can be used for formal events or casual hangouts, but I do not like the color combination because it is less eye-catching." (Rahadian, 22 years old, Female).	
10	"I think the round shape is overused, perhaps to attract attention; it can be with gradient colors or with motifs." (Febby, 22 years old, female)	

Source: Authors data based on interview.

The responses from ten users above can be classified into four response groups such as, Product development and price recommendations focusing on providing product value in terms of product quality and also providing recommendations for selling prices that the general public will accept. Price recommendations which focus on providing product value through selling price recommendations that the community will accept. Business management and price recommendations, focus on providing product value in business management and governance and selling price recommendations that the community will accept. And product development concentrates on delivering product value in terms of product quality. Based on the results of product testing with users, we have some new recommendations, which include:

- Looking for a better iron earring supplier;
- Create designs with more diverse shapes, colors, and motifs;
- Improve craftsmanship by smoothing the product's surface.

V. CONCLUSION AND RECOMMENDATION

The central concept of green entrepreneurship is to change the paradigm from an only profit-oriented business to being oriented towards environmentally friendly goals as well. It can be said that this concept seeks to change the industrial, market, and social order to become more sensitive and aware of the importance of protecting the environment through long-term operational activities (Edufun-Literacy, 2020). Products derived from "waste"

from household consumption can be processed in such a way through an excellent process to create selling value and be accepted by the community. The more businesses care about the environment, the more natural sustainability will be maintained. According to Edufun-literacy (2020), the concept of green entrepreneurship requires at least three things, namely, eco-innovation, which is an innovation in the environmental field, eco-opportunity, namely opportunities that exist in the environment without destroying the environment, and also eco-commitment, which is committed to preserving sustainability.

The concept of design thinking can be applied in various contexts, including business. The concept of design thinking can be used to identify problems and generate practical and innovative solutions. The combination of design thinking and green entrepreneurship can have a positive impact; problem-solving can be done through the design thinking stage to innovate in business while supporting the environmentally friendly movement. When creating a product, it is discovered that it does not always come from new materials; instead, by considering the potential and sensitivity to the environment, waste that is initially not valuable can be processed in such a way that it has a selling value in the end and also produces environmentally friendly products.

The findings of this study benefit those interested in design thinking and green entrepreneurship, as well as those involved in product manufacturing. This research provides readers, environmentally conscious activists, or fashion experts with knowledge about the findings of previous research and a reference for future research. This research can also be used to put researchers' knowledge of design thinking, green entrepreneurship, and the fashion industry into practice. This study is still far from perfection and has several limitations, such as limited relations and a lack of information sources, limited tool utilization, which still relies on rudimentary tools. Also, difficulties in understanding the quality of suitable materials caused the ultimate product to be still inadequate. Therefore, future research is expected to seek the broadest possible source of information in order to cover the opinions of people from various regions, use adequate tools from the beginning to the end of the production process, and learn every detail of the materials to be used in order to obtain high-quality materials.

ACKNOWLEDGMENT

This research is fully funded by PPM Telkom University under the Internal Research scheme in 2022.

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