

The Design Development and Application of Sustainable Design on Workstations

Destin Connelly¹, Maitri Widya Mutiara^{2*}

¹ Interior Design Department, Faculty of Art and Design, Universitas Tarumanagara

² Interior Design Department, Faculty of Art and Design, Universitas Tarumanagara

Corresponding Author: ¹*maitrim@fsrd.untar.ac.id

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Abstract

The high use of materials in the manufacture of furniture makes the furniture design sector become one of the sectors that use natural resources highly, for example, wood. The uncontrolled use of wood materials will result in the deforestation of forest land which is the largest source of oxygen. Therefore, the researcher wants to analyze recycled materials such as plastic and other wood that are sustainable, this is done to achieve the following objectives: (1) Maximizing the use of recycled materials for furniture to reduce the use of excess materials, (2) Designing eco-friendly furniture to meet the needs of the present without compromising the ability of future generations to meet their own needs, (3) Identify the strengths and weaknesses of recycled materials in furniture design. This research uses qualitative methods and case studies with descriptive approach methods as well as collecting observation data through literature study techniques. The results of the analysis state that furniture made from recycled materials, especially plastic materials, to overcome sea water pollution is not impossible, this is supported by the presence of a British couple, Alexander Groves and Azusa Murakami, who have succeeded in creating some household furniture made from recycled plastic. The conclusion, furniture design with the aim of sustainability can be implemented if the technical aspects are well thought out. This is what will be done in the design of the workstation at the Tokopedia office.

Keywords: Eco-friendly, Furniture, Sustainable, Workstation

1. INTRODUCTION

The office is one of the public facilities which is certainly the center of the highest activity for most people who have entered the world of work. This explains that an office must have enough space and also furniture that supports the productivity of its workers. There is also a lot of furniture needed, such as a working desk, a reception desk, and even storage cabinets. An office from a large company certainly requires a large amount of furniture to fulfill all the needs of its workers. To form furniture such as a workstation, of course, requires a lot of material. For example, plywood is produced from solid wood which is processed in such a

way to become thin sheets of wood. Using this wood should be one of the considerations for designers so that the furniture will be designed does not throw away the primary material to pursue aesthetics rather than a function of the furniture itself. This concerns the problem of environmental degradation. Based on the book Complete Dictionary of Geography Terms (2020) by the Panca Aksara Team, environmental degradation is a decrease in the carrying capacity or quality of the environment due to excessive extraction and use of environmental resources. The main issues or problems that cause environmental degradation include:

- Global Warming (Natural Factors) According to the United States Environmental Protection Agency, global warming is an increase in the average temperature of the earth's surface, both past and present. Most of the events are influenced by the greenhouse effect in the earth's atmosphere. This Global warming is the cause of climate change. The other negative impact of global warming itself is an increase in the earth's temperature, rising sea levels, and extreme weather.

- Deforestation (Human Factor) According to the Big Indonesian Dictionary (KBBI), deforestation is the activity of logging commercial timber on a large scale. The deforestation rate in Indonesia itself is closely related to the demand for land for conversions such as oil palm plantations and mining. Deforestation causes the deforestation of forests that are home to wildlife and also the main producer of oxygen. Another negative impact of deforestation is that rainwater cannot be absorbed into the ground which will result in disasters such as landslides or erosion. Erosion causes a decrease in the fertility of the soil itself making it difficult to plant trees again. From this, it can be said that small mistakes can have a big impact that we are not aware of which are related to each other.

From the problems above, it can be concluded that the uncontrolled use of natural resources can result in many problems which of course have an impact on human life. Therefore, we as designers, especially furniture designers, must start to be aware of designing furniture that uses materials efficiently or by using recycled materials that have been widely applied by leading designers out there. Why should we as designers be aware of this problem? As we know that design has a role in "problem-solving" which is finding solutions to existing problems. Not only about anthropometric or ergonomic problems, we as furniture designers also have to find solutions to the consequences of what we are going to design. This is where sustainable design is introduced. Victor Papanek in his book entitled "Design For The Real World." in 1972, criticized the designer profession for creating products by using natural resources in excess, thus fostering consumerism. He challenges designers to produce more ethical products, be technologically appropriate for developing countries, help people with disabilities, and do not harm the environment. He also mentioned the new design culture as a social responsibility.

According to the World Commission on Environment and Development (WCED, 1987), Sustainable development is to ensure the needs of the present without compromising the ability of future generations to meet their own needs. It seeks to reconcile economic development with the protection of social and environmental balance. From here it can be derived into the sustainable design for interior design with the meaning as an interior design approach that can meet the needs of the present without compromising the ability of the next generation to meet their needs.

Product design has also been seen as important in promoting the greater use of sustainable materials. It has been stated that "materials and their design are related and can be used to produce a sustainable product". Yuksel, posits that designers will play a critical role in encouraging the use of sustainable materials in the furniture industry of Turkey by introducing forms that are both functional and visually appealing to consumers.

2. METHOD

The method used in this study is a qualitative method with a descriptive approach. According to Sugiyono (2016:9), qualitative research methods are research methods used to examine the condition of natural objects where the researcher is the key instrument. Meanwhile, according to Moleong (2005:4), a qualitative descriptive approach is a research approach where the data collected is in the form of words, pictures, and not numbers.

This data collection itself is done by using literature study techniques that are directly related to the research topic. The research topic raised is related to sustainable design. Starting from how sustainable design exists, what is the relationship between sustainable design and interior/furniture design to what materials and ways to solve problems related to sustainable design itself.

This study uses data processing methods that are sourced from the reviews obtained, then conclusions are made for the application of sustainable design on workstations at the Tokopedia office (office interior design assignments in the Interior Design course).

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create objects,	systems, structures,	or
components that	are certainly useful	for
humans.		

3. RESULTS AND DISCUSSION

Basically, the main purpose of design is to help humans design an object so that it can be useful for human life. In addition, there are several other design goals such as to solve problems, to

The product that is the object of this research is a workstation which is one of the furniture from the office. Furniture itself comes from the French word *fourniture*. *Fourniture* itself comes from the word *fournir* which means home or room furniture. According to the Big Indonesian Dictionary, furniture is furniture that is needed, useful, or liked, such as goods or objects that can be moved around, used to complete homes, offices, and so on. From the words above, we can conclude that furniture is household furniture such as tables, chairs, cabinets and others that are in a room and are usually used to store or put something. Furniture can also be defined as equipment that can be made from various materials. For example, such as wooden furniture, plastic, metal, and bamboo. Furniture can also be made using a variety of woodworking joints which often reflect the local culture.

There are several requirements in designing a workstation desk in the office, including:

- The size corresponds to the average height of Indonesians. The size of the workbench must have a minimum height of 72.5 cm and a maximum height of 76 cm.
- Must have at least 1 storage drawer for easy storage of hard copy files.
- The table surface is flat and not shiny so as not to dazzle the user.
- Strength of endurance. Office desks as much as possible should be designed to be durable so that they do not always have to be replaced every year. This can reduce expenses and is also more practical than having to replace a new desk every year.
- Area of the table that is not excessive. The surface area of the office desk must be taken into account so that it is not too large so that it is not efficient in its use.
- The shape of the office desk. The shape of the designed office desk must be in accordance with the theme of the office image so that there are no visible

deviations from the application in the workspace.

To support sustainable design, this workstation can be designed using recycled materials to minimize the use of raw materials such as solid wood that is taken directly from the forest. Some examples of furniture that have been successfully shaped through recycled materials and sustainability include:

- **WRECK tables by Bentu Design.**
This table made from Bentu Design utilizes ceramic waste that has been considered trash for others which is converted into a table that is fit for use, this table comes from Chaozhou, China.
- **Chair Charlie by Ecobirdy.**
Chair Charlie is a chair made from recycled plastic toys. This chair is designed for use by children. Ecobirdy itself is very confident in this product and claims that this product is safe for use by children, easy to clean, and of course, complies with ergonomic standards and is comfortable to use.
- **Slice Chair by Graypants.**
This chair is made from recycled materials and uses wood with a certificate from the FSC (Forest Stewardship Council), one of the world's most extensive international certification programs. The FSC recognizes them as the most trusted developer of sustainable forest management standards in the world.

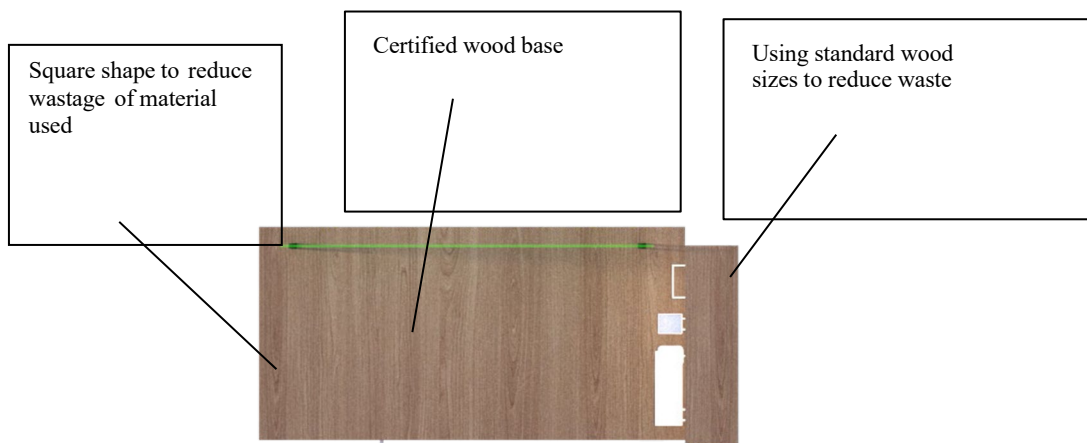
From some of the furniture products above, it can be concluded that furniture made from recycled materials is not impossible to form. This is supported by the success of several brands above in converting recycled materials into ready-to-use furniture and of course having sustainable properties. The implementation of sustainable design on workstations at the Tokopedia office can be shown in the following image.



Picture 1. Workstation Perspective



Picture 2. Workstation Front View



Picture 3. Workstation Top View

The workstation above has green acrylic on it that functions as a barrier between desks, during the coronavirus pandemic, the distance must be applied to break the chain of virus spread. The existence of this pandemic is also related to the theme of sustainable design because they both care about humans, the environment (planet), and welfare. Quoted from liputan6.com, in the conditions of the coronavirus pandemic, we are aware that we need to help each other (the community), that we are also aware that health is important so preserving nature will be very important because it will have a direct impact related to health (planet) other than that for a business to survive, a sustainable business is needed which is certainly profitable/prosperous.

For sustainability, the workstation above uses certified wood. The shape of the table is made square to reduce the wastage of the materials used. For special sizes, it is also adjusted to the size of the wood in general so that there is no excess material excess. This is done so that the main ingredients can be used as much as possible without any wastage.

4. Conclusion

From the discussion and literature studies that have been carried out above, it can be said that furniture with a sustainable design concept does not impossible to be done, it's just that there are still many development processes so that furniture designs with sustainable materials can be produced on an even larger scale. The awareness of designers to move toward sustainable design is certainly good for environmental sustainability and also the sustainability of natural resources for the next generation. And this research was carried out with the hope that more people would begin to realize the survival of the next generation by not using energy wastefully.

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