

A Biomimicry Study of Interface Design for Kitchenware of Pahang's National Park

Norfadilah Kamaruddin*, Noor Shamsarini Md Isa, Nik Nor Azidah Nik Aziz, Inda Murni Hairul Anuar, Mohd Shariful Hafizal Aminuddin, and Fadli Abdul Razak

Creative Visual Exchange Group, Faculty of Art and Design, Universiti Teknologi MARA (UiTM) Selangor, Puncak Alam Campus, Puncak Alam, Selangor
*Corresponding author**

Abstract: Sustainable design currently is becoming a more and more popular and foreseeable perspective of viewing products. Besides, a biomimicry is a science work that studies on nature's ways and then imitates these designs for human problem-solving. Biomimicry moreover can be categories into three different levels: Nature as a model, Nature as a measure, and Nature as a mentor. Thus, the research is carried out by using qualitative research methods to look on how nature's masterpieces pattern would be used as an interfaces for kitchenware product (ceramic) that further presenting a brand for Pahang's National Park. The kitchenware design is based on systematic analysis of local nature patterns collected from plants, fish, and flora within the area of Kuala Keniam, Pahang's National Park. This new set of design kitchenware product visibly significant defines the relationship of nature, and can be applied to practical design to enhance and support visual communication.

Keywords: Nature; Pattern; Colour; Sustainable Design

I. INTRODUCTION

A sustainable design from nature is becoming more popular nowadays and a biomimicry is a science work that studies nature's ways and then imitates these designs for human problem-solving. Mostly, those work defined as biomimicry is originated from applied science field that focus on inspiration from the natural and opens avenues for technological or sustainable design and innovation. For example, biomimicry suggests that study of nature can reveal more sustainable solutions interms of efficient processes, functions, systems and materials. A Biomimicry study moreover can be categories into three different levels: Nature as a model, Nature as a measure, and Nature as a mentor.

Some researchers believe that these dimensions form the basis for classifying the different approaches to biomimicry and various numbers of study were conducted under biomimicry as innovation.

A biomimicry have also been used interchangeably in recent research nowadays. Biomimetics involved with artificial mechanisms to produce materials similar to ones that exist innature(Reap & Bras,2005). Reap & Bras also claimed that biomimicry seeks resolving engineering problems using data related to biological functions and primarily focused on sustainability and imitates nature's efficiency. Despite the dominant role of biomimicry in the industrial sector, the

philosophical aspects of this science have remained under developed and descriptive(Mathews,2011).

Therefore, in the Mother Nature of Pahang's National Park, there are limited number of biomimicry study conducted in term of Nature as a mentor. In this paper, the principal focus is the ability of the philosophical approach of biomimicry to aid in the finding of new techniques in nature for use in art and design field. Thus, the inter-disciplinary research study was carried out by looking at how nature's masterpieces pattern would be used as an image for kitchenware product (ceramic) that further presenting a brand identity for Pahang's National Park. Furthermore, this study attempted to develop the intersection between natural design patterns and sciences, and tried to combine natural patterns with the form design through scientific techniques that can be applied to practical design to enhance and support visual communication.

II. METHODOLOGY

Due to the limitations of existing methods in Art and Design particularly on biomimicry study, this research project was used A Qualitative Analytical Frameworks. As this study mainly focused on analyzing of colors and patterns from animals, insects and plants (flora and fauna) found in Pahang's National Park from two different perspectives (Art and Science), A Qualitative Analytical Frameworks was used through Qualitative Colour Pattern Analysis (QCPA) procedures (Figure 1) to assessing how animals, insects and plants(flora and fauna) colour patterns appear against their natural background as viewed by ecologically relevant species.

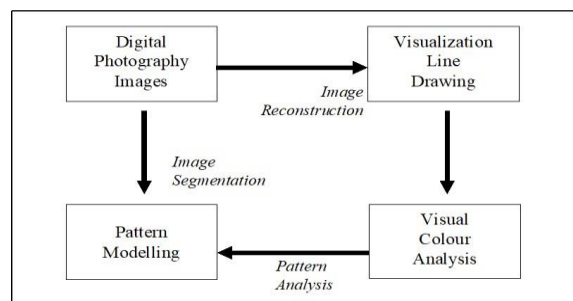


Figure 1: A Qualitative Color Pattern Analysis Framework






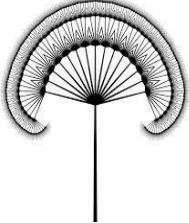
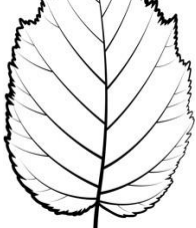
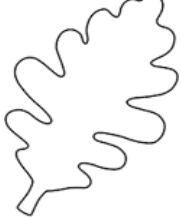




As the research is based on Keniam Trail in Pahang’s National Park, the sample of study were focusing only on the plants that were divided into four group: Ferns, Fungi, Leaves and Fauna. The research design has involved in three aspects (Table 1) : Design Thinking (DT), Design Processes (DP), and Design Tools (DT). This also leads to the design cognitive model of designers and scientist in the product design process.

Table 1: Research Design

Activities	Design Thinking (DT)	Design Processes (DP)	Design Tools (DT)
<i>Arts</i>	Abstract Thinking	Observation Sketches Form and Colour	Line Drawing Graphic Design Prototype
<i>Science</i>	Logic Thinking	Physics Calculation	Algorithm

The photograph images firstly were group according to the types and further were analyzed based on line drawing (Table 2).

Table 2: The types of plants in nature and group in line drawing

Types	Ferns	Fungi	Leaves	Fauna
In Nature				
In line Drawing				
Colors				

III. INNOVATION PROJECT OUTCOMES

Of the 29 sample of animals, insects and plants gained from Keniam Trail in Pahang's National Park, a pattern and colour tribulations are achieved by morphological imitation of natural organisms' patterns and colours. Moreover natural patterns revealed have provided an unlimited source of design and can be effectively applied into form design (kitchenware). This new set of design kitchenware product visibly significant defines the relationship of nature, and can be applied to practical design to enhance and support visual communication.

IV. CONCLUSION

The outcomes of this research have been a merging of aesthetics and science where finding on the science logic behind natural patterns has been a key step for the designers in proposing their new design work. The combination of parametric natural patterns and colours will also open up new methods for designers and scientist to work together. In which, designers are not only required to constantly update their knowledge on design but also need to respect the logical science in environment. Similarly, scientists have required having a parametric aesthetic thinking on the generative system of design. In instance, this study also covered that natural patterns and colours has offered an unlimited source of design and can be effectively applied to form image brand. The findings from the study also contributing to the Sustainable Development Goals (SDG) in environmental benefits, climate action and increased economic stability via forest products. Importantly, giving special attention to how plant in the forestry can provide a therapy through colours and patterns, this study not only shared the findings from two perspectives but also helps in generating sustainable economic growth and society.

ACKNOWLEDGEMENT

This study is part of the 2nd Scientific Exploration at Pahang's National Park which engaged researchers from University Teknologi MARA and The Department of Wildlife and National Parks Peninsular Malaysia.

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