

The Use of Materials in Environmental Sustainability Criteria in Seating Facilities Design Uses the Concept of Metaphor with a Narrative Approach

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Abstract. This study explains how the application of environmental sustainability criteria with the scope of material efficiency on the concept of metaphor in the design of seating facilities with a narrative approach method. The research is based on the results of UNIKOM students' work in the furniture class in 2021. The research lasted for 4 months. Starting from the preliminary design stage to the prototype design. The problem of this research is how the narrative approach method to create seating facilities form through the concept of metaphor related to the use of materials in environmental sustainability criteria and the factors that are considered in the selection of materials in environmental sustainability criteria. This research uses a participatory method. Several student works became the object of research. The stages in the design process are making a narrative that functions as a basic design idea, elaborating the narrative, translating the narrative elements on the design in the form of metaphors and using materials. Method Description is used to explain the use of materials in environmental sustainability criteria in the form of seating facilities. The results of the study show that the use of materials in environmental sustainability criteria cannot be fully implemented because they focus on the narrative. Students create forms based solely on narratives using the metaphorical method. However, there are several works that apply the use of materials in environmental sustainability criteria because they are in accordance with the narrative. The concept of metaphor is a tool that translates narration on the idea of a seating facilities design form. The shape created is an original idea from students, students can explore with imagination through narratives and metaphorical concepts, but narratives about environmental sustainability should be considered in creating forms.

Keywords: environment, sustainability, metphora, narrative

1. Introduction

Development sustainable has a description concept of sustainable design (sustainable design) which focuses on the concept of design philosophy in the form of objects physical, environmental, and services that must be according to the principles of sustainability environment, social sustainability and economic sustainability that strives to reduce the negative impact on environment, health and comfort people in a building [1].

Indonesia's Rating System is GREENSHIP, an assessment tool compiled by the Green Building Council Indonesia (GBCI) to determine whether a building can be declared eligible for "green building"

certification or not. GREENSHIP is uniquely Indonesian, as is the assessment tool in each country which always accommodates local interests. The GREENSHIP certification program is organized by the GBCI Rating Commission in a credible, accountable and full integrity.

In "Poetics of Architecture, Theory of Design," Anthony C. Antoniades said that the use metaphor as a channel to architectural creativity has been architects throughout the century. It has been found to be powerful channel, more useful to the creator than to user or critics." (Antoniades, 1992, P:30), " and also Antoniades mention in the same page ".... metaphor can be helpful in achieving the "new" at many points in the building and the design/conceptual process [1]. According to the statement above that metaphor can create a new form.

This research is based on 24 prototypes produced by students of UNIKOM's interior design study program who take Furniture I courses. The purpose of this course is to create simple sitting facilities that emphasize the exploration of forms and simple construction of a seating facility. This study aims to explain the design ability through narrative translation in seating facility design and also metaphoric capabilities in design. This matter becomes important because the basis of design is creativity and originality. The ability of metaphor is obtained from the narrative approach.

Yinzhu, Xiaochan Yin, Xiaoyong sho, explain about the Metaphora approach in designing furniture in Modern Era, there are two categories about the metaphor, metaphor of similarity of signifier and metaphor of signified. But the research that has been done is research that uses predetermined themes, Chinese song "Jixiangsanbao" (in English means the lucky family of three) themes. So, the prototype that has been produced is more limited [3]. H. Casakin also explained the use of approaches to metaphor design in the studio compared to conventional methods. He wrote that Metaphor is a tool to solve design problems. He did not explain the metaphorical approach with the narrative approach [4]. Same research as H. Casakin; Richard Coyne, Adrian Snorgrad, David Martin, conclude that 1) There is a close relationship between design and metaphor that provides insights into effective design education; (2) metaphor operates through privilege, directing concern and the identification on difference; and (3) design involves the generation of action within a collaborative environment in which there is the free play of enabling metaphors. They do not mention about the design process with narrative approach [5]. Robert Tully explained about narrative imagination: design imperative. He mentioned that narrative imagination has to play in design education and in design in general and he said that it can be intentioned to encourage the highest degree of creativity and innovation from our future generations of students and graduates we must begin to enable the narrative imagination to take them on previously un-imaginable journeys of discovery. He only describes that the narrative imagination can enhance creativity, but he didn't explain about the metaphor in the narrative imagination [6].

Previous studies on metaphor design and narrative design were carried out separately, but the studies explained that both were very important in the design creativity process and did not specifically address the design of sitting facilities. This study aims to look at the process of translating narratives into sitting facilities using the metaphor method and he use of materials in environmental sustainability criteria.

There are two studies related to metaphor and narrative simultaneously, the author has researched about them, in the first research focusing on the creative process (2018) and understanding the form associated with the narrative, the second research, using computer software to support the narrative (2021). Both of them use the metaphorical method in designing seating facilities.

As mentioned in first paragraph above, Green ship as a rating system is divided into six aspects consisting of: Appropriate Land Use (Appropriate Site Development/ASD), Energy Efficiency & Refrigerant (EER), Water Conservation (Water Conservation/WAC), Material Resources & Cycle/MRC, Air Quality & Air Comfort (Indoor Air Health & Comfort/IHC), Building Environmental Management (Building & Environmental Management). In this study only takes part about material resources and cycle that related to their use in sitting facilities design.

This study uses a simple participatory method, which is a method that directly involves students in designing seating facilities. The use of materials in environmental sustainability criteria that listed in Green ship Interior in space that published by Green Building Indonesia (GBCI) 2012 becomes the next discussion in translating the metaphor approach to the narrative method.

2. Method

This research using literature study to explain about metaphors and narrative through definition terminology and then learn about that listed in Green ship Interior in space version 1.0 published by Green Building Council Indonesia 2012. The next step is observation stage process in making seating facility through narrative approach. In this stage, researchers help and assist student in making story and translate into seating facility design. The assignment does not explain about sustainability materials. This study discusses the use of materials in the design process of seating facilities based on the criteria for materials in the discussion of the green ship interior in space such as purchasing policy, waste management policy, non ODS usage, existing material conservation, certified wood, low environmental impact material, green cleaning agent.

This research using 14 seating facility from class of DI-1 and DI-2, odd semester in academic year 2020-2021. The sample consists of 1) Pre-elementary Design 2) working drawing 3) Prototype (three-dimensional rendering).

3. Results and Discussion




3.1. The Using Materials in Seating Facility Models Related to Materials and Resource Cycle in Green ship Interior in Space Sub Chapter materials Resource and Cycle.

The discussion in this section is the use of materials for each model consisting of the constituent materials and finishing materials related to the green ship Interior in space criteria, the Material and cycle sub-chapter namely :1) Purchasing policy, 2) Waste management policy, 3) Non ODS (Ozone Depleting Potential) usage 4) Existing material conservation, 5) Certified wood, 6) Low environmental impact material, 7) Green cleaning agent. 8) Waste Management Practice 9) Purchasing Practice.

In term of the issue of materials using in seating facilities, criteria of point 1, 2, 3, 7,8,9 and 10, more to company issues, while in this case, the issues are individual problems, so according of that there are only criteria of point 4, 5, and point 6 that can relate to the sustainability of the materials.

Table 1. Seating Facility Models Related to Materials and Resource Cycle in Greenship Interior in Space Sub Chapter materials Resource and Cycle

No.	Chair Furniture		Existing material conservation	Certified wood	Low environmental impact material	
1.	Ghina/ Broccoli		Constituent materials			
			• Plywood	V	V	V
			• Iron	V	-	-
			Finishing:			
			• Water Base Natural Melamic	V	-	V
2.	Andreas/ Patra Bali		Constituent materials			
			Plywood	V	V	V
			Iron	V	-	-
			Finishing:			

			Water Base Natural Melamic	V	-	V
			Welding joint	V	-	V
3.	Zahrah/ Roasted Peanuts		Constituent materials		-	
			Plywood	V	- V	V
			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V
			Welding joint	V	-	V
4.	Ibnul/ Bandros		Constituent materials			
			Plywood	V	- V	V
			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V
					-	
5.	Tiara/ Black mamba		Constituent materials			
			Plywood	V	V	V
			Iron	V		-
			Finishing:			
			Water Base Natural Melamic	V		V
			Welding joint	V		V
6.	Yulia/ Lotus Flower		Constituent materials			
			Plywood	V	- V	V
			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V
			Welding joint	V	-	V
7.	Hendriyani /Rose and Pine		Constituent materials		-	
			Plywood	V	- V	V
			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V

			Welding joint	V	-	V
8.	Nurasyifa/ scary cat		Constituent materials		-	
			Plywood	V	- V	V
			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V
			Welding joint	V	-	V
9.	Nuzilla/ spider web		Constituent materials		-	
			Plywood	V	- V	V
			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V
			Welding joint	V	-	V
10.	Indry/ Jackfruit		Constituent materials		-	
			Plywood	V	- V	V
			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V
			Welding joint	V	-	V
11.	Adzkay/ Addicted		Constituent materials		-	
			Plywood	V	- V	V
			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V
			Welding joint	V	-	V
12.	Pramoedya/ Teddy Bear		Constituent materials		-	
			Plywood	V	- V	V
			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V
			Welding joint	V	-	V
13.	Fristy / Cup of coffee		Constituent materials		-	
			Plywood	V	- V	V

			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V
			Welding joint	V	-	V
14	Salma/ Macaron		Constituent materials		-	
			Plywood	V	- V	V
			Iron	V	-	-
			Finishing:		-	
			Water Base Natural Melamic	V	-	V
			Welding joint	V	-	V

According to the table 1, The results of the study show that the use of materials in environmental sustainability criteria cannot be fully implemented because they focus on the narrative. Students create forms based solely on narratives using the metaphorical method. However, there are several works that apply the use of materials in environmental sustainability criteria because they are in accordance with the narrative. The concept of metaphor is a tool that translates narration on the idea of a seating facilities design form.

4. Conclusion

A narrative approach with the metaphor method is one strategy for solving design challenges. Students can use their imaginations to explore the shapes formed by narratives and metaphorical concepts, but when developing forms, environmental sustainability narratives should be considered. As a result, the story must be chosen with consideration for how to apply environmental sustainability principles to material use.

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