Vol. 9, SI No.23 Dec 2024 eISSN 2398-4287

Doi: https://doi.org/10.2183/e-bpj.V9iSI23

E-B

Environment-Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 Sep 2024

Editor-in-Chief
Mohamed Yusoff Abbas
Associate Editors
AUSTRALIA: Ranjith Dayaratne
EGYPT: Rasha Mahmoud Ali El-Zeiny
HONG KONG, CHINA: David Robert Osborne
INDIA: Mohamad Arif Kamal
INDONESIA: Nurlisa Ginting
IRAN: Sharona Ghorbani
MALAYSIA: Rugayah Hashim
NIGERIA: Babatunde Emmanuel Jaiyeoba
TAIWAN: Heng Zhang
TURKEY: Mert Cubukcu

Special Guest Editors
Rafeah Legino
Yulriawan
Yulyta Kodrat Prasetyaningsih
Nandang Septian
Baridah Mutmainah

Indexed in:

Clarivate Analytics
WEB OF SCIENCE
scienceOPEN.com

Available Online:
www.e-iph.co.uk

AMER cE-Bs e-IPH UK

An international publication published four times annually by e-IPH, Ltd, UK, for the Association of Malaysian Environment-Behaviour Researchers (AMER); Centre for Environment-Behaviour Studies (cE-Bs), College Built Environment, Universiti Teknologi MARA, Malaysia

Vol. 9, SI No.23 Dec 2024 eISSN 2398-4287

Doi: https://doi.org/10.2183/e-bpj.V9iSI23

E-B

Environment-Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 Sep 2024

Editor-in-Chief
Mohamed Yusoff Abbas

Associate Editors
AUSTRALIA: Ranjith Dayaratne
EGYPT: Rasha Mahmoud Ali El-Zeiny
HONG KONG, CHINA: David Robert Osborne
INDIA: Mohamad Arif Kamal
INDONESIA: Nurlisa Ginting
IRAN: Sharona Ghorbani
MALAYSIA: Rugayah Hashim
NIGERIA: Babatunde Emmanuel Jaiyeoba
TAIWAN: Heng Zhang
TURKEY: Mert Cubukcu

Special Guest Editors
Rafeah Legino
Yulriawan
Yulyta Kodrat Prasetyaningsih
Nandang Septian
Baridah Mutmainah

Indexed in:

Clarivate Analytics
WEB OF SCIENCE
scienceOPEN.com

Available Online:
www.e-iph.co.uk

AMER cE-Bs e-IPH

An international publication published four times annually by e-IPH, Ltd, UK, for the Association of Malaysian Environment-Behaviour Researchers (AMER); Centre for Environment-Behaviour Studies (cE-Bs), College Built Environment, Universiti Teknologi MARA, Malaysia

INTRODUCTION

Amid global challenges such as climate change, rapid urbanization, and ecosystem degradation, the role of humans in maintaining environmental balance becomes increasingly crucial. Art, as one of the most powerful forms of human expression, has significant potential to foster awareness, change attitudes, and drive actions towards achieving sustainable human well-being. By involving art colleges from both domestic and international institutions, we aim to develop a deeper understanding of how art and creativity can serve as forces for social and environmental transformation. Interdisciplinary collaboration is essential in addressing these complex issues. Art functions not only as an aesthetic medium but also as an educational and advocacy tool that can influence environmental and social policies.

In this context, it is vital to understand and explore how art and human creativity can contribute to environmental balance and human welfare. Additionally, considering the impacts of technology and globalization, we seek to encourage local community participation in using their creativity to advocate for environmental sustainability and enhance overall societal well-being.

With the conference theme "*Transformative Power of Art: Fostering Environmental Awareness and Human Well-being Through Creative Collaboration" the* 8th ART, CRAFT, AND DESIGN IN SOUTH EAST ASIA INTERNATIONAL SYMPOSIUM (ARCADESA) 2024 was organised by and held at the Institut Seni Indonesia (ISI), Yogyakarta, Indonesia on 27 – 28 Sep 2024. Overall 43 selected papers presented were published in this issue.

Yogyakarta, September 2024

Institut Seni Indonesia Yogyakarta,

Faculty of Visual Arts & Design

Dr. Yulriawan Dafri, M.Hum.

TABLE OF CONTENTS

Introduction ……i

Table of Contents ……iii

Enhancing Early Childhood Care and Education Governance for Quality Standards of Education in Malaysia

Nor Shamimi Muhamad Ridza, Yarina Ahmad, Thenmolli Vadevello, Rafeah Legino ……..3-8

Utilizing Illustrations to Visualize Javanese Vocabulary at The Ngoko Level through Social Media Platforms

Edi Jatmiko, Amanda Amalia Faustine Gittawati……..11-17

Knowledge of Natural Materials in Craft Arts in Suriname for Learning Indonesian Carving and Weaving Arts in the Javanese Diaspora Community

Tri Wahyudi, anggar Budi Prasetya, Dipo Krishyudi Ono …….....21-27

Paes Ageng and Paseksen Luhur: Symbolic Meanings of Human Life Cycle Markers

Sugeng Wardoyo, Dias Oktri Raka Setiadi, Tri Wulandari ……29-35

Ansel Adams Easton Study of Work, Artistry, and Social Aspects

Irwandi, Siti Norfatulhana Ishak ……..39-43

Art and Activism: Artists amid social, environmental, and cultural crises

Suwarno ……....45-49

Artistic Hybridity and Local Environmental Awareness: Modern Ink Painting by Nanyang Pioneer Artists

Cui Yi , Sarena Abdullah ……51-55

Exploring the Integration of Artificial Intelligence in Co-Design Framework for Designer

Muhammad Zaffwan Idris, Mohd Ekram Alhafis Hashim, Nursafinas Albakry, Nandang Septian ……..57-61

Industrial Materials to Support Kinetic Sculpture as Interior Elements

Lutse Lambert Daniel Morin, Teerapon Hosanga ……63-69

Subjectivity and Objectivity in Art Axiological

Wan Samiati Andriana Wan Mohamad Daud, Zuriati Mohamad Shaari, Nik Syahida Sabri, Yulriawan Dafri M.Hum ……..71-75

Relevance of Applying Design by Participation Method in Design Learning in Higher Education

Suastiwi Triatmodjo, Mahdi Nurcahyo ……...79-84

Inclusiveness of Social Environment Village as Part of Yogyakarta's Integrated Elderly Service Program

Danang Febriyantoko, Muhammad Fikri Hanafi ……87-92

Wu Guanzhong's Colored Ink Landscapes - An Exploration of the Healing and Environmental Protection Function of the Double Swallows

Zhang Ziyi, Mohd Fuad Md Arif , Wang Yunlong, Zhao Shanshan ……..95-100

Analysis of Environmental Characteristics in Suzhou-themed Landscape Paintings

Xu Yijiao, Sarena Abdullah ……103-109

Reflections on the Application of Low-Tech in Landscape Architecture Design Amid Environmental Crisis

Tang Tingqiang ……..111-116

Application of Kansei Engineering and Analytic Hierarchy Process in Evaluating Design Elements of Traditional Nyonya Kebaya

Guo Chunli, Siti Rohaya Yahaya, Liu Mingquan, Zhang Ning ……...119-126

Creation of Signature Batik From North Sumatra Ethnicity

Wahyu Tri Atmojo ……127-133

Exploring Cultural Diversity: A Comparative Study of Shell Belt Craftsmanship in the Hani/Akha Group

Liu Mingquan, Siti Rohaya Yahaya, Guo Chunli ……135-141

Harmonising Local and Global Wisdom in the Design of Environmentally Friendly, Fashionable, and Sustainable Craft Products

Husen Hendriyana, Khairul Mustaqin, Didik Desanto, Widodo ……143-150

Parametric Design Inspiration Derived from Batik Motif Concepts in Artwork

Rafeah Legino, Ruzayqah Mohd Ghazali, Yulyta Kodrat, Ramlan Abdullah ..151-155

Raising Environmental Awareness Through the Making of Craft-Based Object

Alvi Lufiani, ulriawan Dafri, Syed Mohd Faisal Syed Ahmad ……157-162

Reflecting on a Century of André Breton's Surrealism: Surrealistic Art Exhibition at the Oei Hong Djien Museum

Martinus Dwi Marianto, Oei Hong Djien, Heri Kristanto, Suwarno Wisetrotomo ……..163-168

Royal Influence: Reviving the Tenun Pahang Diraja Weaving Industry in Pahang

Mas Ayu Zainal @ Ismail Zainal a.k.a Ismail, Siti Rohaya Yahaya, Nani Hartina Ahmad ……169-178

Significance of Art Conservation for The Chairman Figure Sculptures of ISI Yogyakarta's Faculty of Visual Arts

Yohana Ari Ratnaningtyas, Tambak sihno Purwanto, Luna Chantiaya Rushartono, Geminisya Aldheana Tania ……179-184

Strategic Strengthening of the Troso Village Fabric Industry as a Sustainable Fabric Center

Jati Widagdo, M. Rifqy Roosdhani, Samsul Arifin, Mujiyono, Nimas Aulia Pambajeng Miftahunnajah ……185-189

"Glass Waste" In The Perspective Of Religious Awareness And Artistic Creativity

Arif Suharson, Dyah Retno Fitiani ……193-200

Analysis of The Chemical Composition, Properties, Aesthetics, and Craft of Zisha Clay: A Potential Environmentally Friendly Material for Jewelry Design

Xiaoli Sun, Siti Suhaily, S., Huasheng Lai, Kaifeng Chen ……201-207

Bamboo Installations Design as an Appreciation of Local and Environmentally Friendly Materials

Vanya Alessandra Leonardo, Amadea ……209-216

Mountains and Rice Fields: Curating Painting and Environmental Issues through the "Landscape of Nation" Exhibition

Mikke Susanto ……..217-223

Possibility of Implementing the Usage of Plants as Colouring Agents for Hard Element

Charusiri Pasu, Irena Vanessa Gunawan ……225-231

Confronting Drug Issues at Kelantan-Thailand Border: In-depth inquiry from internal and external stakeholders

Siti Zulaikha Mustapha, Yarina Ahmad, Nur Amalina Aziz, Amanda Balqis Mohd Mazalan, Umi Nurul Najihah Azman, Nor Azira Ayob, Nor Suziwana Tahir ……..235-240

Identity of Dream Home: An Architecture Review

IF Bambang Sulistyono, Silmi Cahya Pradini Priliana ……243-248

Interiority Study: Quality of interior rental flats desired by low-income communities in urban areas

Muhamad Sholahuddin ……249-255

Cultural Microcosm in Focus: Landscape and Identity in Small Village Explored Through Design and Environment-Behavior Theories

Nandang Septian ……..259-265

A Phenomenological Expressionist Approach to Mixed Media Painting

Wang Yunlong, Mohd Fuad Md Arif, Zhang Ziyi, Yang Zifan ……269-275

From Industrial Waste to Art: Innovative Applications of Jun Porcelain Waste in Sustainable Environmental Design

Lai Huasheng, Siti Suhaily S., Deng Weibin, Sun Xiaoli ……277-282

Impact of Residents' Participation in Traditional Community Activities on Future Environmental Program In Yogyakarta, Indonesia

Artbanu Wishnu Aji, Suastiwi, Agus Burhan ……283-290

Organic Crafts: Optimization of Environmentally Friendly Materials in Craft Products

Yulriawan Dafri, Alvi Lufiani, Christabel Raissa Justine Herman, Gheitsa Alya Dinnia ……..291-296

Recycling Textile Waste For Craft Industries: An Experimental Approach to Eco-Friendly Papermaking

Siti Rohaya Yahaya, Jazmin Mohamad Jaafar, Liu Mingquan, Guo Chunli ……..297-304

Remove the Asphalt Paving: De-Modernism

Yusaku Imamura ……..305-310

Colouring Space in Virtual Reality: A-Chromatic and chromatic composition and color saturation affecting visual perception

Yulyta Kodrat P, Mutia Nurdina, Rafeah Legino ……..313-319

From Paper to Screen: Transitioning conventional posters to digital posters for environmental sustainability

Petrus Gogor Bangsa ……..321-326

Future of Waste Bin Design in the Age of Automation in Indonesia

Baridah Mutmainah, Flavia Alice Mameli ……327-332

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Enhancing Early Childhood Care and Education Governance for Quality Standards of Education in Malaysia

Nor Shamimi Muhamad Ridza[1], Yarina Ahmad[1,2], Thenmolli Vadevello[1], Rafeah Legino[3*]

[*] *Corresponding author*

[1] Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA, 40450 Shah Alam, Selangor Malaysia
[2] Institute for Biodiversity and Sustainable Development, Universiti Teknologi MARA, 40450 Shah Alam, Selangor Malaysia
[3] College of Creative Arts, Universiti Teknologi MARA, 40450 Shah Alam, Selangor Malaysia

mimiridza@gmail.com, yarina@uitm.edu.my, thenmo020@uitm.edu.my, rafeahl@uitm.edu.my
Tel: +0173680870

Abstract
Children are valuable assets for the nations. Global organizations like UNICEF and the OECD highlight the importance of high-quality ECCE, aligning with the Sustainable Development Goals (SDGs) 2030. In Malaysia, the governance of ECCE is separated into different agencies. This qualitative study applied in-depth interviews with key informants from four leading agencies involved in ECCE governance. The findings show that the legislative framework, historical aspects, and the differences in roles and functions influence the separation of the ECCE governance in Malaysia. Thus, clear standard is needed to enhance the monitoring and assessment of the delivery of ECCE services.

Keywords: ECCE; governance; standard; quality education

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6350

1.0 Introduction

There is a saying that "It takes a village to raise a child." This proverb reflects the collective responsibility of the government, communities, educational institutions, and families in raising children. In the context of the ECCE, the governance structure plays a significant role as it becomes the "village" since it acts as a guide in ensuring the effectiveness and efficiency of the care and education for young children. Children are seen as a country's greatest resource, representing the future potential and success of the nation. Global entities such as the United Nations International Children's Fund (UNICEF), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and the Organization for Economic Cooperation and Development (OECD) have highlighted the importance of high quality care and education for children. This is also aligned with the Sustainable Development Goals (SDGs) which under Target 4.2, highlight that by 2030, all children, boys and girls, will have access to quality early childhood development, care, and pre-primary education so that they are fully ready for primary school.

The early years of a child's life, particularly from birth to six years old, are a critical period in children growth. Multiple studies consistently indicate that early years are essential for creating a solid basis for cognitive, emotional, and physical development. It is

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6350

crucial to have high quality ECCE since it provides children with a strong foundation which is needed for lifelong learning (Tayler et al., 2016; Duncan et al., 2023). Governments worldwide invest significantly in early childhood care and education (Engel et al., 2015). When nations prioritize the ECCE, they make long-term investments in human capital. In Malaysia, there are two main agencies that are responsible for overseeing and monitoring the two groups of ECCE, which are childcare and preschool services. The Children Development Department under the Ministry of Women, Family, and Community Development is responsible for monitoring for care services for children from birth to age four. Whereas, the Ministry of Education oversees preschool education for children aged four to six. The distinction between these two age groups is mainly from differing perspectives on care and education. For children from newborn to four years old, the focus is mainly on care and welfare services. In contrast, the children aged from four to six years old focus on meeting children's educational needs through preschool programs. Other agencies, such as the Department of National Unity and Integration, the Community Development Department, the private sector, and the Non-Governmental Organizations (NGOs) also provide childcare and preschool services in Malaysia. This shows that Malaysia's ECCE has a separate or split governance structure since there are multiple agencies that manage ECCE programs.

According to the OECD (2015), countries are currently tending towards an integrated care and education system run by either a single ministry or an independent agency to achieve better governance. This is because the separation of the governance structure resulted in operational and regulatory procedures that were unequal and unclear (Chin et al., 2021). These procedures included funding disparity, non-standardization of staff training and qualification requirements, and poor quality control for kindergartens and childcare centers. For this reason, this paper discussed the justification for the separation of the governance structure of the ECCE in Malaysia. It explores the fundamental causes of the separation of the ECCE and examines the various responsibilities that different organizations play in the supervision of the ECCE.

2.0 Literature Review

According to UNESCO (2022), ECCE refers to the period from newborn to eight years of age. It involves childcare and preschool services provided by the government or private sector. The care services are more concerned with the children's welfare and well-being while the parents are working. Whereas preschool focuses on education, aiming to prepare the children for formal primary school. Governments globally are progressively prioritizing ECCE due to its critical role in establishing the basis for lifetime learning and enhancing the overall quality of life (UNICEF, 2004; Bakken et al., 2017; Twelfth Malaysia Plan, 2021-2025). As mentioned before, the existing governance structure of the ECCE in Malaysia is separated. This has led to complexity since there are many actors involved in the system.

The United Nations (2000) defines governance as making and implementing decisions. It claims that governance is about recognizing the formal and informal actors participating in the decision-making process and the frameworks that should be used to ensure the efficacy and efficiency of decision delivery. The actors involved include not only the government but also other stakeholders. For example, in the context of the ECCE, the government, educational institutions, community, and parents are the actors involved in the system. In addition, according to Boon (2010), governance is responsible for determining the accountability and duties of every party involved. Each organization founded has its own duties and purposes, and these roles and purposes are connected to other interests as well. In the context of early childhood governance, for instance, there are a number of agencies associated with early childhood, such as the Ministry of Education, the Children Development Department, the Department of National Unity and Integration and the Community Development Department. While all these agencies have different roles and functions, they all have the same goal when it comes to children: to provide the best quality ECCE services. The separation of the governance structure, led to fragmentation of services, variances in procedures, legal requirements, teacher training and qualification, and funding disparity.

Malaysia is not the only country that runs ECCE under two different sets of rules (care and education). In many other countries' ECCE systems, care and education are also handled by different people. For example, according to Silva et al. (2018) France has two ministries in charge of young children: one is for children from birth to age three (Ministry of Economic and Social Nature), and the other is for children from age three to six (Ministry of National Education). On top of that, Hong Kong, Korea, and China have split government systems similar to this one (Tsegay et al., 2017). In contrast, some countries have a unitary system for ECCE, which differs from a split government. In 2015, Italy changed how its ECCE system worked so that the Ministry of Education, University, and Research was in charge of the whole system for children from birth to six years old. Before this, Finland switched to a unitary government in January 2013, and the Ministry of Education and Culture now runs all ECCE programs (Silva et al., 2018).

Many difficulties have arisen due to the separation of the ECCE governance system, namely concerning the efficient monitoring and provision of ECCE services. Boon (2010) points out that the implementation and monitoring of the ECCE in Malaysia are poorly governed. For example, it was revealed that over 50% of Johor's childcare providers were not registered with the Department of Social Welfare (The Star, 2022). This occurred due to the laborious and confusing registration process involving numerous authorities, including the Department of Social Welfare, the State Health Department, the Fire and Rescue Department, and the Local Authority (Chin et al., 2021). Furthermore, this is due to non-standardized procedures in terms of operation and regulation since each agency has its own standard operating procedure.

However, even though there is a separation in governance structure, some nations still practice this structure by coordinating all the agencies that are related to the ECCE. France is an excellent example of this. The nation regularly offers high-quality services despite having a separate ECCE system. France's rich legacy with ECCE—one field pioneer—helps explain this accomplishment. Drawing on its long-standing experience in early childhood education, France has constructed a well-coordinated system ensuring that its ECCE services satisfy high requirements (Silva et al., 2018). Furthermore, Singapore's government formed the Early Childhood Development

Agency (ECDA) in 2013 as an autonomous agency to manage the ECCE system. The ECDA reports to the Ministry of Social and Family Development and Ministry of Education (Wu et al., 2021). This initiative aligns with the global trend where many countries have transitioned toward a unitary or integrated ECCE governance structure.

3.0 Methodology

3.1 Research Design

The UiTM Research Ethics Committee has approved this qualitative study (REC/01/2024 (PG/MR/2)), which employs in-depth interviews to investigate the study's objectives through the selected sample comprehensively. According to Creswell (2015), qualitative research is an investigative process in which researchers systematically evaluate and interpret social phenomena. According to Ahmad et al. (2021), the use of in-depth interviews in a study can provide a deeper comprehension of the problems. This study employs an inductive approach as it investigates the justification for the separation of the ECCE governance structure in Malaysia. This paper is based on an in-depth interview with a key person from four main agencies related to ECCE governance in Malaysia.

3.2 Informants and Data Collection

This research used purposive sampling for the in-depth interviews. According to Saunders et al. (2019), purposive or judgmental sampling enables the selection of specific cases that are most likely to provide answers to the research questions. According to Campbell et al. (2020), the informants for in-depth interviews are purposefully chosen to develop a deeper understanding of the topic. This study's four key informants were from the Children's Development Department, the Ministry of Education, the Department of National Unity, and the National Integration and Community Development Department. This decision was made since these departments and ministries govern the ECCE services in Malaysia.

4.0 Findings

4.1 Profile of Informants

This paper used purposive sampling for a total of four key informants who were interviewed during the data collection for this study. Table 1 presents specific information for all key informants.

Table 1. Demographic profile of informants

Pseudo	Gender	Years of Experience	Ministry / Department	ECCE Programs
KP1	Female	>5 years	Ministry of Education	Preschool
KP2	Female	>5 years	Children Development Department	Childcare
KP3	Female	>5 years	Department of National Unity and Integration	Childcare & Preschool
KP4	Male	>5 years	Community Development Department	Childcare & Preschool

4.2 Separation of ECCE Governance

During the interview sessions, the key informants were asked about Malaysia's existing ECCE governance structure. The key informants explained the reasons for the separation in the ECCE governance: legislation, history, roles, and functions. The key informants also emphasize the importance of having standards to coordinate despite the separation of governance.

KP3 explained the legislative differences between childcare and preschool, "*We cannot make changes to the division between kindergartens and nurseries because they are governed by the Childcare Act, which clearly states that nurseries are for children aged 0 to 4 years, while kindergartens cater to children aged 5 and 6, under the Ministry of Education."*

This is also supported by KP2 that*, "Nurseries for children under 4 years old fall under the Childcare Act 1984, which is governed by the JKM."*

She further explained that on the reason why the childcare under JPNIN and KEMAS is not under them, *"However, if you've gone to the Ministry of Rural Development, they also have nurseries, such as PERMATA KEMAS, which we recognize as nurseries under the management of a federal agency. These nurseries do not need to be registered under the Childcare Act 1984 because they are already governed by the government structure."*

When discussing the emergence of childcare services, KP2 mentioned, *"We are more commonly known for caregiving because there isn't yet an early childhood curriculum like formal education. So, we are more referred to as providing caregiving and development, where, for example, at the age of one, we only teach how to button a shirt and similar tasks. That's not formal education, just basic skills, which fall under our responsibility."*

Another key informant (KP1) highlighted the different roles among the agencies: *"We need to recognize that children aged 0 to 4 are not yet in the education stage; they are in the caregiving stage. It's only from ages 4 to 6 that we start talking about education. So, the 0 to 6 age range falls under early childhood education. If caregiving were to be included under the Ministry of Education, they would need a structured curriculum. However, caregiving at that level doesn't require a curriculum with assessments and all that. That's why caregiving is placed under the Ministry of Women."*

This also aligns with KEMAS, as their main focus is on children in rural areas. As KP4 stated, *"When it comes to early childhood education, we have programs in KEMAS aimed at kids, especially in rural areas. The idea is pretty much the same—it's all about helping children in those places. We provide early education by setting up classes that we develop in these rural areas."*

He further explained, *"So, that's how we can help children in rural areas. We want to ensure that kids in rural settings have similar opportunities as those in urban areas. The goal is to expose them to education early on so they're not just starting school in Grade 1. That's the purpose of implementing early childhood education through various agencies like KEMAS."*

This focus is similarly reflected in the JPNIN approach. When asked about their focus and function, KP3 answered, *"We focus more on suburban and rural areas, as well as the diversity of ethnic groups."*

During the interview, the key informants also highlighted the importance of having a standard for coordination despite having the separation of the governance approach.

"There can be multiple implementing agencies involved[…]However, it is crucial to have appropriate standards.."(KP1)

When asked about the aspect that needs to be included under this standard, she replied, *"Standards should be established regarding teacher qualifications, the curriculum, and the support provided."* (KP1)

She also agrees that there is a lack of monitoring due to the separation of the governance, *"Right, so when it comes to the curriculum, there's no problem with the main one, but there are some extra curriculums being used. No one is really supervising those."*(KP1)

This also aligns with KP2's view, as she stated, *"So far, we have a special committee chaired by the Minister of Education, along with the YB from our ministry."*

"We cannot eliminate KEMAS and JPNIN, but without proper monitoring, their standards may become inconsistent." (KP2)

KP3 also emphasized the need for coordination, *"One of the weaknesses I observe in various agencies is the lack of coordination. A simple example is in the implementation of the curriculum."*

"That's just one aspect of the curriculum. Additionally, there is a lack of alignment in terms of funding, with some agencies receiving allocations quickly while others experience delays. For instance, the Ministry of Education receives its funding for meals faster due to significant increases, while we, from other agencies, often receive our allocations later."

5.0 Discussion

The in-depth interview with key informants gave an understanding of Malaysia's separation of the ECCE governance. The first reason for the separation is because of the legislation. This is because there is a stipulation in the law that the Childcare Act 1984 caters to the age of birth to four years old, while the Education Act 1996 includes preschool education, which starts from four years old and continues until six years old. Each Act is also designated to specific governing bodies, which include the Department of Social Welfare (JKM), which governs the Childcare Act 1984, and the Ministry of Education, which regulates the Education Act 1996. Thus, to reform ECCE governance, the legislation must be amended by revising the Childcare Act 1984 and the Education Act 1996 to create a new framework that governs ECCE from birth to six years old. This requires a cooperative effort between all agencies related to Malaysia's ECCE.

Secondly, the separation of the ECCE governance is also due to the history of establishing the ECCE programs themselves. As mentioned by the key informants, childcare is commonly referred to as caregiving, where they offer daycare services for the child while the parents are working. According to Chiam (2008), childcare services were founded in the late 1970s, when there was an increase in demand by working mothers. Thus, the care service is usually seen as an informal education program that cares for the children's well-being without having any formal curriculum or assessment. It is different from preschool, according to Kamerman (2007), where the program is first provided by the Ministry of Education to enhance the children's development and to ensure that the child is ready before they go to formal primary school. Thus, it can be seen that there has already been a distinction between the roles and functions of care and education a very long time ago.

Not only that, the separation of governance is also due to the role and function of different government agencies. As mentioned by the key informants, each agency has different roles and functions. For example, the Community Development Department's (KEMAS) primary focus was providing ECCE services to rural children to ensure they would be included like other children, especially from the urban areas. On top of that, KEMAS was also the first agency to provide ECCE services at the beginning of the 1970s (Boon, 2010). This is also the same with the Department of National Unity and National Integration (JPNIN), where unity is the main objective in their ECCE programs. Due to this, it can be seen that every agency has its function and goals regarding ECCE programs. These functions complement each other so that no children will be left behind.

Despite the reasons for the separation, there is a need for standards for better coordination. The ECCE structure is complex since multiple agencies serve the programs. This led to unclear procedure and regulation requirements, unstandardized curriculum implementation, fragmentation of services, and issues in teachers' training and qualifications (Chin et al., 2021). Good coordination is necessary to monitor and assess the quality of the ECCE services (Megalonidou, 2020).

6.0 Conclusion and Recommendations

In conclusion, the complexity of the ECCE governance structure in Malaysia is due to the separation of the agencies that govern the ECCE. An in-depth interview was conducted to gain a deeper understanding of Malaysia's existing ECCE governance structure. The separation is due to the agencies' legislation, roles, and functions. Thus, there is a need to have a clear standard to standardize all the ECCE programs. This requires a good coordination governance structure to ensure that all agencies can collaborate to provide high-quality ECCE in Malaysia.

Paper Contribution to Related Field of Study

This paper advances the field of ECCE by addressing ECCE governance through in-depth interviews with four leading agencies that govern the ECCE in Malaysia. Our findings demonstrate that the main factors that influence the separation are the legislative and historical influence and each agency's different roles and responsibilities. This research provides an understanding of the complexity of the existing ECCE governance and highlights the need for standardization to coordinate the agencies.

References

Ahmad, Y., Abd Hamid, S. N. F., Tahir, N. S., Ahmad, J., Aziz, N. A., & Mustapha, S. Z. (2021). Social construction and identity formation of 'street children' in the Malaysian context. Journal of Engineering Science and Technology, Special Issue on IAC2021, 46-61

Bakken, L., Brown, N., & Downing, B. (2017). Early Childhood Education: The Long-Term Benefits. *Journal of Research in Childhood Education*, *31*(2), 255–269. https://doi.org/10.1080/02568543.2016.1273285

Boon, N. S. (2010). Governance of Education Related ECCE Policies in Malaysia . *4*(1), 45–57.

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of research in nursing : JRN*, *25*(8), 652– 661. https://doi.org/10.1177/1744987120927206

Chiam, H. K. (2008). Child Care in Malaysia: Then and Now. *International Journal of Child Care and Education Policy*, *2*(2), 31–41. https://doi.org/10.1007/2288-6729-2-2-31

Chin, T., Bing, C. Y., Dhamotharan, M., & Mustafa, M. C. (2021). Issues and challenges in early childhood care and education centre registration process: What the operators say. *Southeast Asia Early Childhood Journal (Special Issue)*, *10*, 53–62. http://ejournal.upsi.edu.my/index.php/SAECJ.https://doi.org/10.37134/saecj.vol10.sp.5.2021

Creswell, J. W. (2015). *Qualitative and Mixed-Method Approaches*. 147–166. https://doi.org/10.4018/978-1-4666-8116-3.ch010

Duncan, G., Kalil, A., Mogstad, M., & Rege, M. (2023). Investing in early childhood development in preschool and at home. *Handbook of the Economics of Education*, *6*, 1-91.

Engel, A., Barnett, W. S., Anders, Y., & Taguma, M. (2015). Early childhood education and care policy review. *Norway: OECD*.

Economic Planning Unit. (2021). *Twelfth Malaysia Plan*. https://www.malaysia.gov.my/portal/content/31186

Kamerman, S. B. (2007). A Global history of early childhood education and care. *Paper Commissioned for the EFA Global Monitoring Report 2007, Strong Foundations: Early Childhood Care and Education*, 1–92. http://unesdoc.unesco.org/images/0014/001474/147470e.pdf

Megalonidou, C. (2020). The quality of early childhood education and care services in Greece. *International Journal of Child Care and Education Policy*, *14*(1). https://doi.org/10.1186/s40723-020-00074-2

OECD (2015), *Starting Strong IV: Monitoring Quality in Early Childhood Education and Care*, Starting Strong, OECD Publishing, Paris, https://doi.org/10.1787/9789264233515-en.

Silva, C., Fresch, E., & Casellic, P. (2018). ECEC in the European Union: analysis and governance of ECEC systems of four Member States. *Form@re - Open Journal per La Formazione in Rete*, *18*(1), 234–247. http://dx.doi.org/10.13128/formare-22725.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *for business students fifth edition REVISAR*.

Tayler, C., Cloney, D., Adams, R., Ishimine, K., Thorpe, K., & Nguyen, T. K. C. (2016). Assessing the effectiveness of Australian early childhood education and care experiences: Study protocol. *BMC Public Health*, *16*(1). https://doi.org/10.1186/s12889-016-2985-1

The Commissioner of Law Revision Malaysia. (2006). *Act 550 EDUCATION ACT 1996*. *January*, 1–89. http://www.agc.gov.my/agcportal/uploads/files/Publications/LOM/EN/Act 550.pdf

The Commissioner Law of Malaysia. (2016). Act 308 CHILD CARE CENTRE ACT 1984. *January*, https://unicefeaproecdtoolkit.wordpress.com/wp content/uploads/2017/08/act-308-child-care-center-act-1984.pdf

The Star. (2022, June 11). Regularisation process finds 1,028 unregistered childcare centres, says Rina. The Star. https://www.thestar.com.my/news/nation/2022/06/11/regularisation-process-finds-1028-unregistered-childcare-centres-says-rina

Tsegay, S. M., Kansale, C., & Goll, S. P. (2017). An Analysis of Early Childhood Education Policy in China. *Pacific Early Childhood Education Research Association*, *11*(1), 69–84. https://doi.org/10.17206/apjrece.2017.11.1.69

UNESCO.(2022), “Early Childhood Care and Education.” Early Childhood Care and Education | UNESCO, 1 Jan. 2022, www.unesco.org/en/education/early-childhood.

UNICEF. (2004). The State of the World ’ S Children 2004: Girls, Education and Development. *Unicef*.

UNICEF. (2019). *Every child learns*. 64. https://www.unicef.org/media/59856/file/UNICEF-education-strategy-2019-2030.pdf

United Nations General Assembly. (2020). Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development. Work of the Statistical Commission Pertaining to the 2030 Agenda for Sustainable Development, 1–21. https://unstats.un.org/sdgs/indicators/Global Indicator Framework after 2019 refinement_Eng.pdf%0Ahttps://unstats.un.org/sdgs/indicators/Global Indicator Framework_A.RES.71.313 Annex.pdf

United Nations. (2000). *No. 30676. United Nations (Economic and Social Commission for Asia and the Pacific) and India*. 69–70. https://doi.org/10.18356/d4072237-en-fr

Wu, S., & Perisamy, A. (2021). Infant-toddler care in Singapore: Journey towards quality. *Policy Futures in Education*, *19*(2), 175–196. https://doi.org/10.1177/1478210320966503

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta
https://arcadesa.isi.ac.id/index.html
8th Art, Craft and Design in Southeast Asia International Symposium
ISI Yogyakarta Indonesia, 27-28 September 2024
Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Utilizing Illustrations to Visualize Javanese Vocabulary at the Ngoko Level through Social Media Platforms

Edi Jatmiko*, Amanda Amalia Faustine Gittawati
**Corresponding Author*

Vocational Study Program Media Design,
Institut Seni Indonesia Yogyakarta, Yogyakarta, Indonesia

edijatmiko@isi.ac.id, amanda.amalia@isi.ac.id
Tel: +6281231973638

Abstract
Javanese, spoken by over 46% of Indonesia's population, features complex verb variations at the Ngoko level, where one verb can have multiple names depending on context. This diversity makes documenting daily vocabulary challenging and often overlooked in general dictionaries. This research supports the Merdeka Belajar Episode Seventeen program for regional language revitalization by documenting Ngoko vocabulary. Using action research, it collects linguistic publications, field notes, and recordings to create animated visual media that illustrate verb variations. Social media tools like Instagram, Twitter, and Facebook are also used to document and share vocabulary, leveraging virtual interactions for additional insights.

Keywords: Vocabulary trainer; Ngoko Javanese

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6144

1.0 Introduction

Three provinces in Indonesia dominate Javanese speakers in Indonesia based on data from the Central Bureau of Statistics, namely Central Java 34,738,200, Yogyakarta 3,919,2000, East Java 39,955,900. In addition to these three provinces, areas in the country that massively use Javanese are Banten, Sumatra, and a small part of the Maluku, Papua, and Kalimantan communities. In addition to Indonesia, Javanese is also spoken by 68,278,000 people, spread across Suriname, New Caledonia, and Sabah, Malaysia.

Although the Javanese language is still in a safe condition according to UNESCO, it is also gradually experiencing threats, as mentioned by Austin and Sallabank (2011: 5-6)

a. Economic factors, such as rural poverty, cause urbanization. Basuki Hadimuljono said Java Island will become an urbanized island when the High-Level Roundtable on Fostering Growth and Inclusion in Asia's Cities is opened at the Kempupera building in Jakarta on Monday, September 30, 2019. "In the future, urbanization may no longer be in cities. Java has become an urbanized island. Maybe it will not take five years if the toll road network is connected,"
b. The factor of cultural domination by the majority community, for example, education and literature that only uses the majority language or the state language; as a result, regional languages become marginalized. In 1928, when Malay was named Indonesian and followed in 1945, it became the state language, as stated in the 1945 Constitution Article 36. Thus, Indonesian automatically

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6144

became the state's official language and was widely used in official (formal) domains such as, for example, as a language of instruction in state events and educational institutions, causing Javanese to experience a shift (language shift).

c. Attitudinal factors, for example, minority languages are associated with poverty, illiteracy, and suffering, while majority languages are associated with progress. The general perception of Javanese people is still shrouded in negative stigma, for example, the nickname "udik", "ndeso", and a weak economy and low education. This causes the younger generation of Javanese to prefer the national or even the international language when interacting, including in the virtual realm.

It is related to these conditions and supports the Ministry of Education, Culture, Research and Technology (Mendikbudristek) program, namely launching Merdeka Belajar Episode Seventeen: Revitalization of Regional Languages. One form of revitalization that can be done is language documentation.

Language documentation begins with developing activities to cooperate with the speech community in a language. Its development can be seen from several stages, including data collection, processing, and storage. In detail, Austin (2006: 89-110) identifies the documentation process in five stages: Recording, Recording relates to the use of visual media and text. It is capturing digitizing the conversion of analog media into digital. Analysis: analysis relates to transcribing, translating, annotating, and notating metadata. Archiving deals with the creation of archives and access and usage rights. Mobilization and mobilization deal with publishing and distribution.

The results of this research can serve as a crucial reference for efforts to preserve other regional languages in Indonesia that are beginning to disappear, particularly those spoken on islands beyond the region of study. Indonesia's vast archipelago is home to immense linguistic diversity, yet many regional languages face the threat of extinction due to diminishing speakers and shifting cultural practices. By analyzing the factors that contribute to language endangerment and the methods used to promote revitalization in this study, similar approaches can be tailored to the unique contexts of other islands. For instance, integrating local languages into school curriculums, utilizing digital platforms to document and teach these languages, and fostering intergenerational transmission are strategies that can be replicated. This research underscores the urgency of preserving regional languages not just as communication tools but as carriers of cultural identity and history, ensuring their survival amidst Indonesia's dynamic and diverse cultural landscape.

2.0 Literature Review

2.1 Research Objectives

1. To collect Ngoko Javanese at the level of Javanese-speaking communities and to develop corpus data. The vocabulary set at the level of community speakers can be used as a complement to Javanese dictionaries, especially at the ngoko level.
2. Give verbal meaning and then visualize the vocabulary in a visual illustration format so that it can be easily identified and understood by people from all walks of life.
3. Distributing Ngoko Javanese vocabulary on social media platforms and then utilizing the interaction in the comments column to collect vocabulary not recognized by other loci even though they both speak Javanese.

2.2 Problem Identification

As we know today, many regional cultures, including the regional language, have begun to be forgotten. Many people prefer foreign languages and slang to existing local languages. This results in a decline in the preservation of existing regional culture. Many people need help learning existing regional languages due to the variety of languages in Indonesia; one example is the regional language from Java, which has several levels of language in its use; therefore, a medium is needed to make it easier to learn existing regional languages. Applied research related to Ngoko Javanese vocabulary props is focused on the following aspects:

a. Ngoko-level Javanese vocabulary content is limited to verbs with hypernym-hyponym structure. The diversity of vocabulary that refers to one activity is influenced by position, pose, gesture, and chronology.
b. Tembung Kriya (verbs) of Ngoko Javanese is limited to daily vocabulary in interactions between individual Javanese speakers.
c. Ngoko Javanese vocabulary is limited to Javanese speakers commonly used in the Yogyakarta area; for the vocabulary of Javanese speakers domiciled in the Central and East Java regions, vocabulary is only taken that has similar pronunciation and dialect.
d. Social media used for corpus data collection is WhatsApp application, then for media distribution purposes using Instagram, Twitter, and Facebook.

3.0 Methodology

The method used in this research is descriptive qualitative. This research was studied through two approaches: the theoretical approach and the methodological approach. Theoretically, a sociolinguistic approach is used. Meanwhile, methodologically, a descriptive qualitative approach is used. This approach was chosen because the research method used in this study is the Research & Development (R&D) method. The R&D model is a stage or sequence of steps supporting each other. These stages are expected to answer the problems of this research. The object of this research is linguistic terms often used in the daily communication of Javanese people. The data were obtained from literature and respondents from the community with a specific age range in Yogyakarta and Surakarta. Data were collected through interviews, observations, and questionnaires.

The type of applied research chosen is action research, which focuses on social action. The aim is to develop the lives and conditions of the research subjects. Applied research is conducted because it aims to find a solution to a problem directly faced by the community or industrial/business organizations.

The applied research stages of designing Ngoko Javanese vocabulary props in the classification of tembung kriya are:

a. The preparatory stage includes determining the purpose of making vocabulary props and the work approach. The next step is collecting the elements used, such as capital, computers, human resources, and other equipment needed.
b. Corpus data development, the second stage after designing the Ngoko Javanese vocabulary trainer is corpus data development. This stage involves collecting as many references as possible to collect the original words used by the Javanese-speaking community. After the words are collected, what needs to be done is sorted according to a specific pattern.
c. Data processing: After going through the collection and sorting stages, the words are analyzed in this stage. At this analysis stage, it produces a classification of words in the form of Leah words (unnecessary), new words, neologism words (new words but rarely used), and words that experience changes in Meaning.
d. Giving Meaning: Giving Meaning is the last stage in data preparation in the Ngoko Javanese vocabulary. At this stage, each word that has gone through the above process is described in terms of its Meaning. This means giving is allowed to refer to existing references such as dictionaries, glossaries, and other references that are still relevant.

4.0 Findings

This research uses data from a collection of Javanese words derived from the Javanese-Indonesian language dictionary. Researchers limit the scope of this research; applications that will be made in the research can run using mobile phones with an Android operating system and only discuss translators of Javanese words into Indonesian and Indonesian into Javanese.

In the design of social media content, tembung kriya (verbs) utilizing the snowball sampling technique is a method for identifying, selecting, and sampling in a continuous network or chain of relationships. Researchers present a network through a sociogram image as a picture of circles associated or connected by lines. Each circle represents one respondent or case, and the lines show the relationship between respondents or between cases (Neuman, 2003). Another opinion says that the snowball sampling technique is a method in which the sample is obtained through a rolling process from one respondent to another. Usually, this method is used to explain a particular community's social or communication patterns (sociometrics).

Applying the snowball sampling technique in the applied research of vocabulary documentation of colloquial verbs in Javanese society through social media applications and interactions therein can significantly contribute to revealing extraordinary phenomena in the field of Javanese vocabulary. One of the contributions of applying the snowball sampling technique can be described below. When the researcher, a social media admin, releases three samples of Javanese vocabulary on a specific schedule, tempting kriya basa on the post within a certain period, the sampling or social media followers will interact in the comments column. The interaction is in the form of responses and responses expressed in the form of writings that can be collected and documented with valid data in the form of commenters, time including the day, date, and time of commenting, and the form of text thrown. The comments can be classified into seven response patterns: comparison, confirmation, clarification, validation, verification, affirmation, and submission.

1. Responses in the form of comparisons: usually, the respondent compares the vocabulary posted with vocabulary with the same meaning, but there are differences, even if only in terms of dialect or writing. For example, the vocabulary of tembung kriya refers to a fall in the Sleman area of Yogyakarta, and the city generally uses the term "tiba." However, some respondents said that in their area, they use the terms "jiglok, lugur".
2. Responses in the form of confirmation are generally respondents expressing reaffirmation of whether the proposed meaning is correct; this often occurs due to differences in pronunciation and meaning due to geographical differences. For example, the vocabulary in the post is "jempalik" then the respondent asks again, "Isn't the correct one "jempalit"".
3. In Response to clarification, generally, respondents try to fix the meaning that needs to be completed, not incorrectly. For example, in the vocabulary post "ngeplak" the meaning mentioned is hitting the cheek area with the palm. However, there was a clarification from the respondent who said that "ngeplak" is not always in the cheek area but can be in all areas of the head.
4. Feedback in the form of validation: respondents tried to do an act of proof. Usually, respondents provide links from sources considered more valid, such as online dictionaries, expert opinions, or research results. Feedback in the form of validation is needed to increase the repertoire of meanings from valid sources and references.
5. Response in the form of verification generally involves respondents conveying a logical statement about something presented in the post. In some conditions, a valid source is sometimes used as a reference for the post, but some respondents complement the meaning with additional sources.
6. Response in the form of affirmation Generally, respondents express positive determination, affirmation, and affirmation of the post, both visual and verbal interpretation, usually added with a request to add and continue posting the following vocabulary.
7. Response in the form of submissions Generally, respondents propose additional vocabulary that has not been mentioned. Response in the form of submission is the main objective in applying the snowball sampling technique. The comment section elicits responses with the presentation of additional vocabulary.

5.0 Discussion

5.1 Exploration of The Illustration Style

Line art is a work in which each picture consists of straight or curved lines arranged to form an object. Line art can also be interpreted as graphic art that uses lines as the basis for creating illustrations. Line art is used to draw two or three-dimensional objects, colored inside and out for various purposes.

In its application, line art can also be given additional shading and texture to add a specific artistic impression to create valuable art. Before photography, line art was the standard illustration for print media when conveying information. Until now, line art has been used for illustration and instructional purposes, such as in instant noodle food packaging to show how to cook.

Generally, line art uses black colors, but for specific purposes, line art uses colors other than black. Coloring line art other than black is to identify specific information, such as distinguishing an object and background. The color difference in line art is also intended to distinguish section by section.

Fig. 1. Initial exploration of the design style to illustrate the sitting posture.
(Source: Jatmiko, 2024)

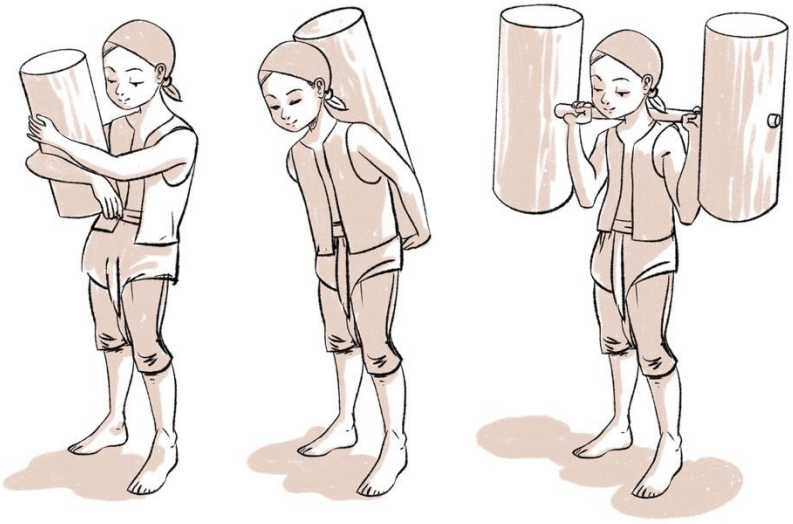


Fig. 2. Initial exploration of design force determination to illustrate lifting attitude.
(Source: Jatmiko, 2024)

Fig. 3. Final results of the sitting posture vocabulary demonstration.
(Source: Jatmiko, 2024)

6.0 Conclusion and Recommendations

The emphasis of this research is on the translation between two different formats, namely verbal, as a collection of Javanese vocabulary at the level of oral use, with a single vocabulary translated into a qualitative description using the illustration format. These two visual formats certainly have characters and patterns of artistry and output results that differ significantly even though they highlight and raise the same object, namely vocabulary. Vocabulary visualized in the form of illustrations can present a visual form closer to meaning than verbal descriptions.

In today's digital era, where social media platforms like Instagram dominate daily interactions, people who use Javanese and other regional languages in Indonesia have a unique opportunity to actively discuss and promote the rich vocabulary of these languages, particularly words and expressions that are beginning to disappear and are rarely recognized. Regional languages are not only a means of communication but also a repository of cultural heritage, values, and wisdom passed down through generations. However, many words and phrases are at risk of being forgotten as younger generations increasingly shift to using Bahasa Indonesia or even foreign languages online. By leveraging Instagram's widespread reach and engaging visual formats, such as reels, stories, or carousel posts, speakers of Javanese and other regional languages can showcase these endangered vocabularies through creative content. For instance, they can share word-of-the-day posts, use traditional words in memes, or create short videos explaining their meanings, cultural context, and relevance. Such efforts would not only make these words more familiar to younger audiences but also spark interest and curiosity in exploring their linguistic roots. Additionally, using trending hashtags and collaborating with influencers or cultural organizations can amplify the visibility of these efforts, ensuring that regional languages are celebrated and preserved in modern discourse. By being proactive in incorporating disappearing vocabularies into social media discussions, people can transform platforms

like Instagram into tools for linguistic preservation, ensuring that the beauty and depth of Javanese and other regional languages remain alive and accessible to future generations.

Acknowledgment

Implementing the Social Media Content Design of Basa Ngoko Vocabulary Props as an Effort to Document the Javanese Language was carried out according to the target and fulfilling the design objectives as targeted in the proposal. For the support of facilities and research funding, sincere gratitude is expressed to (1) DIPA ISI Yogyakarta in 2022, (2) the chairman of LPPM ISI Yogyakarta, Dr. Nur Sahid, M.Hum. and his staff who have provided direction for research activities, (3) the respondents who have contributed Ngoko Javanese vocabulary.

Paper Contribution to Related Field of Study

The benefits of research with the title "Illustrations for Javanese Vocabulary Props" for the scientific field of Visual Communication Design (DKV) include:

1. Increasing the Effectiveness of Visual Communication

This research can contribute to developing effective visual communication methods to introduce and teach Javanese vocabulary. With the exemplary illustration, vocabulary can be understood faster and easier by various groups, including children and adults.

2. Culture Preservation and Conservation

Through illustrations that highlight Javanese vocabulary, this research helps preserve local culture. Attractive visualization can promote the use of the Javanese language in daily life, especially among the younger generation, who may be less familiar with the language.

3. Learning Media Development

This research can be the basis for creating interactive and creative learning media that combine text and illustrations. This will assist educators in delivering Javanese learning materials in a more exciting and accessible way.

4. Innovation in Visual Design

Using illustrations in Javanese vocabulary aids encourages innovation in design techniques and styles. This challenges designers to create visually pleasing and functional designs in the context of education and communication.

5. Application of Design Principles in Local Context

This research enables the application of universal design principles in a local context, namely Javanese language and culture. This can be an example of how visual communication design can be adapted to meet specific cultural needs.

7. Visual Literacy Enrichment

This research helps enrich visual literacy by introducing illustration as a language-learning tool. It teaches how visuals can be a powerful communication tool in education.

References

Arikunto, S. (2005). *Pendekatan dalam Proses Belajar Mengajar*. Bandung: Remaja Rosdakarya.

Chaer, A. (2007). *Leksikografi & Leksikografi Indonesia*. Jakarta: Rineka Cipta.

Collins Dictionaries. *English Visual Dictionary: A Photo Guide to Everyday Words and Phrases in English*. London: HarperCollins Publishers, 2020. K

Hardyanto & Utami. (2001). *Kamus Kecik Bahasa Jawa Ngoko Krama*. Semarang: Lembaga Pengembangan Sastra dan Budaya.

Hinton, L. (2011). *Revitalization of Endangered Language.* Dalam Peter K. Austin dan Julia Sallabank, eds, The Cambridge Handbook of Endangered Languages. Cambridge: Cambridge University Press.

Indah, S. (2019). *"Pemanfaatan Media Sosial Sebaga Meedi Pemasaran Edukasi Ana Usia Dini."* Komunikasi 9.

Indrayanto, B., & Yuliastuti, K. (2015). *Fenomena Tingkat Tutur dalam Bahasa Jawa Akibat Tingkat Sosial Masyarakat.* Magistra, 27(91).

Josephson, Sheree, dan James Kelly (Editor). *Handbook of Visual Communication: Theory, Methods, and Media*. New York: Routledge, 2020.

Kress, Gunther, dan Theo van Leeuwen. *Reading Images: The Grammar of Visual Design*. New York: Routledge, 2020.

Kristiyono, Jokhanan. *Komunikasi Grafis*. Jakarta: Prenada Media, 2020.

Purbohastuti, A. W. (2017). *"Efektivtas Media Sosial Sebagai Media Promosi",* Ekonomika, 12.

Sasangka, S. S. T. W. (2009). *UnggahUngguh Bahasa Jawa* (Editor: Yeyen Maryani). Jakarta: Yayasan Paramalingua.

Sudarmanto. (2012). *Kamus lengkap bahasa Jawa : Jawa-Indonesia, Indonesia-Jawa* / Edisi, Cet.7. Semarang Widya Karya.

Sudaryanto. (2015). Metode dan Aneka Teknik Analisis Bahasa: Pengantar Penelitian Wahana Kebudayaan Secara Linguistis. Yogyakarta: Sanata Dharma University Press.

Yasa, I Wayan Adi Putra, et al. *Desain Komunikasi Visual: Teori dan Perkembangannya*. Jakarta: PT. Sonpedia Publishing Indonesia, 2024.
Zoetmulder, P.J. (1995). *Kamus Jawa Kuna Indonesia* Gramedia.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Knowledge of Natural Materials in Craft Arts in Suriname for Learning Indonesian Carving and Weaving Arts in the Javanese Diaspora Community

Tri Wahyudi[1*], Hanggar Budi Prasetya[2], Dipo Krishyudi Ono[3]
**Corresponding Author*

[1] Universitas Esa Unggul, Jakarta, Indonesia
[2] Institut Seni Indonesia, Yogyakarta, Indonesia
[3] Universitas Pakuan, Bogor, Indonesia

tri.wahyudi@esaunggul.ac.id, hanggarbp@gmail.com, dipo@unpak.ac.id
Tel: +628179 485 917

Abstract
As part of a country in the South American region, Suriname has approximately 15% of the population of Javanese ethnicity; they come from communities that experienced part of the migration process during the Dutch colonial period. They are still trying to find a cultural identity from Java in Indonesia, including making traditional art. However, the materials used to make conventional works of art are quite different from those in Indonesia. The research employs qualitative methods, revealing that wood carving and weaving art techniques enhance Suriname's identity, allowing it to compete and create products on par with other communities.

Keywords: Suriname; craft arts; Javanese diaspora

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6142

1.0 Introduction

Suriname is part of the South American region. Approximately 15% of the population of Javanese ethnic origin come from communities that experienced part of the migration process during the Dutch colonial period; the culture that entered various aspects of the social environment of the community seems to be adopted into a cultural identity in the Javanese community in Suriname, as well as other ethnicities this identity becomes very important amid various tribes, races, The number of ratios is as follows in the country of Suriname, namely the first is derived from ethnic Indians which amounted to approximately 27%, which is then followed by creole and maroon ethnic communities around 15%, which is then followed by Javanese ethnicity which amounted to 13%, and the rest is followed by Indigenous Amerindians and other migrants.

Each ethnicity that initially became immigrants in the country indeed continues to seek cultural values and identities brought by their ancestors who were brought in during slavery to become enslaved people or coolies who worked in the plantation and processing industry in sugar factories; for example, we can see now on *Diwali day which continues to* be celebrated by people of Indian descent in

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6142

Suriname, Suriname Amerindian culture which is the indigenous tribe of Suriname which usually also celebrates indigenous day every August 9, and also a dance culture which is also always celebrated by people of African descent.

What is interesting about the Creole ethnicity is that the culture from Africa that they bring to Suriname is not only performing arts but also traditional fine arts that appear in their carved artwork; this may also be the anxiety of the Javanese community in Suriname so that an NGO / NGO called VHJ / Sana Budaya was formed where the organization accommodates the Javanese community of Suriname to become a gathering place, One of the parts of Sana Budaya is the establishment of the Volksacademie made by the artist Soeki Irodikromo specifically to teach fine arts, one of the activities is making handicraft art.

They are still trying to find a cultural identity from Java in Indonesia, including making traditional artworks. However, the materials used to make traditional artworks differ significantly from those in Indonesia. Transferring knowledge about the materials and skills used to make traditional artworks is very important for the Javanese ethnic community so that this knowledge can be used to further clarify the value of local wisdom from the Javanese in the form of art knowledge that can be adopted and developed again by the Javanese in Suriname and enrich the cultural diversity of the Surinamese nation.

2.0 Literature Review

Research on using natural materials in craft has been of interest in various studies, mainly about utilizing local knowledge and cultural heritage in art practices. This journal highlights the natural resources in Suriname and their potential in teaching carving and weaving to the Surinamese Javanese diaspora community. The challenges and opportunities faced in learning and preserving traditional arts in a foreign country are the main focus of this review.

2.1 Crafts and Knowledge of Natural Materials

Craft is an art form that utilizes natural materials to create beautiful and functional works of art. Local knowledge of natural materials, such as plant fibers, wood, and natural dyes, is essential in the making of craft art; a journal written by Surya & Mutmaniah entitled "Anyam Crafts as Preservation of Local Wisdom" can provide insight that even woven art in its manufacture correlates with local natural resources (Surya & Mutmaniah, 2015), even in the archipelago we can find it quickly so that weaving can be applied to make various kinds of crafts such as mats, baskets, and hats.

2.2 Javanese Diaspora in Suriname

The Javanese diaspora community in Suriname has a long history that began with the arrival of Javanese immigrants in the late 19th and early 20th centuries. According to a research journal titled *"Where is Home? Changing Conceptions of the Homeland in the Surinamese-Javanese diaspora,"* written by Hoefte & Mingoen (2022), many of them strive to maintain and teach Javanese cultural heritage, including in the arts. However, the younger generation often lacks the necessary knowledge and skills to continue this tradition.

2.3 Learning the Art of Jepara Carving

An article entitled "The Regeneration Crisis of Young Carvers and the Existence of Jepara Carving Cultural Wisdom (Case Study in Mulyoharjo Village, Jepara Regency)" written by Rokhis Saidah, Semarang State University became a literature study that learning the art of carving and weaving requires a deep understanding of the issue of regeneration to the community (Saidah, 2017), not only in terms of techniques and materials. In Indonesia, this technique is passed down from generation to generation through a teacher-student or family system; learning Jepara carving art becomes an identity for carving art adopted by the Javanese community by conducting learning in the Surinamese Javanese community can simultaneously regenerate the ability of carving art as well as Javanese identity.

2.4 Local Knowledge in Suriname

The book, derived from research entitled "Ethnobotany Linking Traditional Plant Use to Health, History, and Heritage," found that local knowledge about natural materials in Suriname is rich and diverse. The study (Andel, 2014) shows that local people deeply understand various types of wood, plant fibers, and natural dyes that can be used in craft art. The Javanese diaspora community can utilize this knowledge to develop their carving and weaving practices.

2.5 Cultural Integration and Preservation

A journal entitled "Pandanus Woven Crafts: A Creative Industry Based on Local Wisdom for National and Global Markets." It is one of the literature reviews in this journal because it contains how knowledge of materials and tools derived from nature, namely pandanus, can be utilized for the manufacture of craft art; the connection with craft knowledge in Javanese Surinamese society, in particular, can be a comparison to try to integrate Surinamese local knowledge with traditional Javanese art practices to enrich the learning process and cultural preservation. This journal studies the potential and prospects for pandanus woven crafts from pandanus Samak species as a superior creative industry based on local wisdom. The method used is descriptive qualitative, which describes the definition, raw materials, equipment, production techniques, and product results. This study is expected to provide insight into the sustainable craft industry and inspire the growth of new businesses in the field of pandanus woven crafts in Suriname.

3.0 Methodology

The writing of this journal reinforces the research conducted by the previous author that the identity of the Javanese ethnicity in Suriname will finally find a new cultural pattern both from the pattern of daily life, culture, behavior and even artistic expressions, both visual and performing arts which of course cannot be separated from the influence of Javanese ethnic culture in general but turns into a new culture as a result of the combination of all the elements that exist in the aspects of various environments and cultures in South America. In this study, the author used a qualitative research method using the "Case Study" theory approach.

The steps taken to use qualitative research methods with an explanatory case study approach (Subadi, 2006), are as follows:

1. Case Selection: Selecting a specific study case involves defining criteria to choose participants or phenomena relevant to the research question. This study focuses on providing carving and weaving instruction to the Surinamese Javanese community. The participants are Javanese individuals enrolled in carving and weaving courses at VHJI (Sana Budaya).

(a) (b)

Fig. 1: (a) Weaving course in Sana Budaya; (b) Woodcarving course at Sana Budaya
(Source: Wahyudi, 2018)

2. Data Collection: A thorough and systematic approach is meticulously employed to gather data using various methods suitable for a qualitative framework. These methods include interviews, observations, document analysis, and examination of artifacts. Data collection involved asking questions to participants of the carving and weaving courses at VHJI (Sana Budaya) between July 30 and October 10, 2018.

(a) (b)

Fig. 2: (a) Discussing the shape of Javanese ornaments; (b) Course participant interviews and discussions
(Source: Wahyudi, 2018)

3. Data Analysis: The collected data is analyzed to identify patterns, themes, and relationships. Qualitative data analysis techniques typically involve note-taking and developing theoretical interpretations based on the results of interviews with course participants at VHJI (Sana Budaya) in Suriname.

4. Refinement: The research process is not a rigid framework but rather a flexible and adaptable journey. It is refined iteratively based on analyses, demonstrating its adaptability. This may involve adjusting data collection strategies or revising the theoretical framework, highlighting the research's flexibility and robustness.

5. Report Writing: The research findings are presented in a written report. This report includes a clear outline of the research methods, a presentation of the data analysis, and an interpretation of the results in the context of the research question. It reflects the insights gained during the study, particularly emphasizing the unique perspectives of the Surinamese Javanese community.

4.0 Findings

The introduction of traditional fine arts or crafts to the Surinamese Javanese community, in principle, is not something new to them; amidst the cultural crossing that occurs between ethnicities in the Surinamese community, one of the artistic forms of traditional fine arts in the form of carving has long been developed by the Maroon tribe in Suriname, they with the ability to make carved works of art by utilizing simple materials such as natural wood, cutters, sandpaper, and others can create an authentic work of art and eventually become an identity of art in the tribe.

(a) (b)

Fig. 3: (a) Maroon tribe carving artwork; (b) Maroon Wood Carving Equipment.
(Source: Wahyudi, 2018)

In 2018, the Embassy of the Republic of Indonesia in Paramaribo, led by the Indonesian Ambassador, Dominicus Supratikto, initiated an initiative to send artists from Indonesia, namely Tri Wahyudi and Pudji Utomo, for the first time to assist in making carving and weaving art to people of Javanese descent in Suriname. The initiative was held in several places, such as Sana Budaya and Directorate Culture Suriname.

In conducting this activity, the more effective method is the community development method, which looks at common interests, identifies needs, and then carries out the same activities to solve the community's needs. According to Chambers, community empowerment is an economic development concept that summarizes social values. This concept reflects a new paradigm of development that is "people-centered," participatory, empowering, and sustainable. Empowerment is broader than just an effort to meet basic needs or a mechanism to prevent further impoverishment processes (safety net). According to Jim Ife, the concept of empowerment has a close relationship with two main concepts, namely, the idea of power ("power") and the concept of disadvantage ("inequality"). The definition of empowerment can be explained using four perspectives: pluralist, elitist, structuralist, and post-structuralist.

The level of participation from the Javanese community, especially those of Javanese descent, was unexpectedly high. Their enthusiasm was evident in the three-month learning program, which was followed with great zeal. All their works were proudly exhibited at the Indofair event

5.0 Discussion

In this regard, the author uses pluralist empowerment as one of the perspectives to empower the people of Suriname. From a pluralist perspective, community empowerment is a process that helps individuals and groups of disadvantaged people compete more effectively with other interests. The empowerment effort is to help them learn, use lobbying skills, use media related to political action, and understand how the system works (game rules). Therefore, efforts are needed to increase the capacity of the community to compete pretty so that no one wins or loses. In other words, community empowerment is an effort to teach groups or individuals how to compete within the rules.

So, from this perspective, the author uses a teaching method using two media, namely the media of Traditional Fine Arts and the media of Carving and Weaving Art techniques; the following describes the learning techniques used in these media.

5.1 Wood Carving

The Fine Arts were brought to teach the Surinamese community to use traditional acceptable arts methods, namely wood carving and weaving art. Carving and weaving are part of Javanese culture, and the Surinamese Javanese community is also interested in learning them. The carving learning model brought for learning in Suriname is the same form of learning in Indonesia, which, in this case, the author adopts from the learning system learned by carving craftsmen living in Jepara, Central Java.

The carvers in Jepara use several tools and techniques related to the tools the craftsmen call Tatah (Javanese language) or Pahat (Indonesian language). In 1 box sheet, the tool is approximately 25; the following describes some of the tools used for learning traditional fine arts:

1. Tatah / Chisel (Penguku, Kol, Penyilat)
2. Ganden/Wood Hammer
3. Paper, Pencil, Eraser
4. F-Clamp

As for wood media, we do not find teak wood at all in Suriname, as wood is commonly used to make carved works of art. The reason for using Teak wood is that it is not only challenging and easy to shape, but the quality of the wood fiber character has a fairly artistic shape. That's why teak wood is in great demand among Javanese people who want to own artwork. In addition, teak wood is very easily obtained on Java island because most villagers are still cultivating the plants to be planted.

The solution to the problem is that Teak wood is not found in Suriname. The participants, under the assistance of the carving teacher, tried to find alternatives, one of which was cedar or Pisi wood. The quality of cedar wood, which is very light, strong, and easy to shape, makes this wood a medium for carving and art for learning about the Javanese community of Suriname.

(a) (b)

Fig. 4: (a) Art carving activities at VHJI; (b) Wood raw materials and chisels.
(Source: Wahyudi, 2018)

5.2 Weaving Art

(a) (b)

(c) (d)

Fig. 5: (a) Amerindian weavers; (b) Woven works from Suriname, guided by Pudji Utomo;
(c) Peat pandan plants used as woven raw materials; (d) Pandan strands that have been dried and colored
(Source: Wahyudi, 2018 & https://en.pantaugambut.id/insights/preserving-the-mystical-power-of-pandan-weaving)

The Surinamese Javanese community is quite familiar with the Art of weaving because one of the purposes of Sana Budaya / VHJI is to introduce this culture by assisting people who want to learn. Besides that, the local wisdom of the indigenous Surinamese Indians also has a tradition of weaving.

Pudji Utomo, a craft artist, tries to introduce weaving art to the Surinamese Javanese community by introducing weaving art motifs from Indonesia and using pandanus plant media in weaving art.

Suriname is also where Pandanus plants grow, and the Surinamese Javanese also call it so. In Indonesia, not all pandanus can be used as handicraft art; only some are of Sea Pandanus or Pandanus Samak as people call it; in scientific language, this plant is named *(Pandanus odoratissimus L.F).* Pudji Utomo and Tri Wahyudi also introduced knowledge like this as an introduction to materials before carving and weaving art because Javanese people rarely use all materials to create Art.

The wood carving and weaving art learning program in Suriname is a record of cultural diplomacy efforts carried out for the first time. Furthermore, this is also the first time since the establishment of diplomatic relations between the two countries that the Government of the Republic of Indonesia has sent two handicraft art teachers to present and teach cultural arts in the form of carving and weaving art from here it can be seen that the aesthetic values of handicraft art in the local wisdom of Javanese culture can be taught to Surinamese Javanese who have never set foot on the land of their ancestors. Moreover, of course, the value of the local wisdom of Javanese cultural arts is expected to be accepted. It can be an identity that can add pride to a nation's self-identity in the diaspora in search of its identity in art and culture.

6.0 Conclusion and Recommendation

The conclusion of the introduction of Carving and Weaving Art is that the need to find identity in the form of traditional artworks for the Javanese community of Suriname is very important because by knowing traditional art, they can get to know their cultural identity amid the intersection of multicultural cultures in Suriname.

Cultural identity, as a cultural force, plays a pivotal role in shaping a harmonious communal society. The preservation of local wisdom, passed down by our ancestors, is not just a marker of our identity but also a cornerstone in our journey towards a civilized society. The recommendation that can be given to the community is that cultural identity in a person is very important in the midst of a modern society that always tries to orient itself to Western culture.

The community in Suriname is one example of a Western society that still adopts Eastern or local culture brought by its ancestors so that local wisdom values can still be maintained.

The challenge for any community that becomes a diaspora is the sense of alienation experienced when they are far from their ancestral roots. The Javanese community in Suriname acknowledges this struggle, as they are a minority group. Consequently, the issue of identity becomes a continuous quest, where the values of local wisdom from their ancestors serve as a foundation for maintaining an ongoing affirmation of a Javanese identity (Meel, 2011) within the multicultural context of Suriname.

Learning the arts of carving and weaving is an integral part of Javanese culture in Indonesia, deeply embedded in their society for generations. This artistry is reflected in everyday items, such as the 'tampah' used for cleaning rice seeds and the 'caping' that farmers traditionally wear in the fields. Additionally, carved ornaments have historically adorned the interiors of Javanese homes. Unfortunately, these cultural expressions are rarely found within the Javanese community in Suriname.

Acknowledgment

This paper is dedicated to the development of the archipelago's crafts in Indonesia, as well as thanks to the government and the Non-Governmental Organization in Suriname, because without the excellent cooperation of these two organizations, the cultural arts teaching program would not run smoothly in Suriname, in this case from the government agency in Suriname represented by Directorate Cultuur and from the non-governmental organization represented by VHJI (Vereneging Herdenking Javaanse Imigratie) Sana Budaya, which provides a place to process to introduce Indonesian art in Suriname until it makes an art exhibition and is involved in the Indofair event which is an annual event of the Indonesian government to showcase Indonesian creative industry products so that people in the South American region can widely recognize Indonesia. Also, the Indonesian Embassy in Paramaribo and the PPSDK Language Agency provided recommendations so that the diaspora community in Suriname could identify the archipelago's crafts.

Paper Contribution to Related Field of Study

The writing in this paper contributes to the scientific field of visual arts. It can be applied in craft studies to understand the material tools and materials used, technical knowledge of the art of carving and weaving, or the art of archipelago crafts that can be learned by anyone who does not only exist in Indonesia. As part of the global community, it is our responsibility to preserve and promote the art of archipelago crafts. One of the things that can be learned is that the archipelago ornament can be used as a form of art object in the diversity of art ornaments in the world, and also an understanding that materials derived from nature in Indonesia can be further developed to create a work of art that has identity and can utilize materials from nature that are environmentally friendly, such as teak wood and pandan leaves that can be found daily around us.

References

Bruner, J. (1990). *Acts of meaning: Four lectures on mind and culture* (Vol. 3). Harvard University Press.

Clark, E. H. (2020). *Iron Gongs and Singing Birds: Paths of Migration and Acoustic Assemblages of Alterity in the Former Dutch Colonial Empire*. Columbia University.

Eskak, E., Retnawati, N., Ambarwati, D. R. S., Effendi, A., & Azizah, S. A. N. (2022). Pandanus Wickerwork: Creative Industry Based on Local Wisdom for National and Global Markets. In Proceedings of the National Seminar on Craft and Batik Industry (Vol. 4, No. 1, pp. 04-1).

Geertz, C., & Supomo, S. (1976). Agricultural involution: the process of ecological change in Indonesia. *(No Title)*.

Hoefte, R., & Mingoen, H. (2022). Where is home? Changing conceptions of the homeland in the Surinamese-Javanese diaspora. *Wacana, Journal of the Humanities of Indonesia*, *23*(3), 2.

Gunawan, I. (2013). Qualitative research methods. *Jakarta: Bumi Aksara*, *143*.

Javanese Gamelan. (2014. January 5) accessed on August 25, 2021 from scientific articles : https://jawaforstudent.wordpress.com/2014/01/05/gamelan-jawa/

Ismael, Y. (1955). *"Indonesia" on the shores of the Atlantic ocean: an examination of the economic and social position of the Indonesian people in Suriname*. College Library, Ministry. PP and K..

Melissen, J. (2011). *Public diplomacy and soft power in East Asia*. Springer.

Meel, P. (2011). Continuity through diversity: The Surinamese Javanese diaspora and the homeland anchorage. *Wadabagei*, *13*(3), 95-134.

Murwanti, A. (2017, October). Practice-led Research Approach as a Fundamental Effort to Address the Imbalance between Fine Art Creation Practices and Academic Publications in Indonesia. In *National Seminar of Art and Design 2017* (pp. 16-23). State University of Surabaya.

Nye Jr, J. S. (2008). Public diplomacy and soft power. *The annals of the American academy of political and social science*, *616*(1), 94-109.

Subadi, T. (2006). Qualitative research methods.

Surya, A., & Mutmaniah, S. (2015). Kerajinan anyam sebagai pelestarian kearifan lokal. *Jurnal Dimensi Seni Rupa Dan Desain*, *12*(1), 1-10.

Saidah, R. (2017, December). Krisis Regenerasi Pengukir Muda dan Eksistensi Kearifan Budaya Ukir Jepara (Studi Kasus di Desa Mulyoharjo, Kabupaten Jepara). In *Forum Ilmu Sosial* (Vol. 44, No. 2, pp. 107-115).

Setiawan, A., & Sulaiman, A. M. (2017). Development of Carving Motif Design to Actualize Jepara's Identity as a Carving City. Andharupa, 3(1), 31-48.

Surinamese-Javanese Gamelan Tradition. (2019. May) accessed on August 25, 2021 from scientific articles : https://www.immaterieelerfgoed.nl/nl/page/4952/surinaams-javaanse-gamelan

van Andel, T. (2017). Ethnobotany. Wageningen University.

Wardany, O. P. (2016). UNCOVERING REALITY WITH ART PROJECT AS A METHOD OF CREATION IN MEA. *INVENTION*, *1*(1), 109-127.

Wahyudi, T. (2020). Seniman Mengajar Sebagai Metode Program Pendampingan Psikobudaya Masyarakat. *Artchive: Indonesia Journal Of Visual Art And Design*, *1*(1), 59-71.

Wahyudi, T. (2021). Residensi Seni Rupa Dan Bahasa Indonesia Di Suriname. *Jurnal Pengabdian Masyarakat Abdimas*, *7*(4), 303-307.

Wahyudi, T. (2021). Hibriditas Kebudayaan Jawa Suriname Pada Alat Musik Gamelan. Gestalt, 3(2), 115-124.

Wahyudi, T., & Anggraeni, P. (2022, December). Gastronomi Pada Identitas Masyarakat Diaspora Jawa di Suriname. In *Prosiding Seminar Nasional Desain Sosial (SNDS)* (Vol. 4, pp. 299-305).

Yani, Y. M., & Lusiana, E. (2018). Soft Power and Soft Diplomacy. *Tapis Journal: A Journal of Islamic Political Aspirations*, *14*(2), 48-65.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

6th Art, Craft and Design in Southeast Asia International Sy

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Paes Ageng and Paseksen Luhur: Symbolic meanings of human life cycle markers

Sugeng Wardoyo[1], Dias Oktri Raka Setiadi[2], Tri Wulandari[3]

[1] Program Studi D4 Desain Mode Kriya Batik, Fakultas Seni Rupa dan Desain Institut Seni Indonesia, Yogyakarta, Indonesia
[2] Program Studi Magister Geografi, Fakultas Geografi Universitas Gadjah Mada, Yogyakarta, Indonesia
[3] Program Studi S1 Kriya, Fakultas Seni Rupa dan Desain Institut Seni Indonesia, Yogyakarta, Indonesia

sugeng.wardoyo@isi.ac.id, dias.oktri.r@mail.ugm.ac.id, tri.wulandari@isi.ac.id
Tel: +62 813-9303-9442

Abstract
The Nusantara society tries to blend in and preserve the sustainable environment through symbols. One is contained in the bridal attire as part of the human life cycle marker. This article aims to reveal the drapery motif's form, function, and symbolic meaning in the Paes Ageng Yogyakarta and Paseksen Luhur Samin bridal attire. The analytical method uses structural analysis of forms, functions, symbols, and values in the human life cycle tradition.The symbols of *pinuwunan, pinyuwunan, pratanda,* and *pranata* symbols are values in achieving safety and a reminder for the bride to preserve their environment.

Keywords: bridal attire; human life cycle; *Paes Ageng Yogyakarta; Paseksen Luhur Samin*

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6143

1.0 Introduction

Javanese attire habits emphasize material aspects and moments as social markers. Crawfurd (2017) looks at Javanese civilization in the past as pioneers in attire, refinement, and royalty adopted even to the point of excess (Wijanarko, 2021). The attire procedure in *Mataraman* culture originated within the Surakarta Hadiningrat and Ngayogyakarta Hadiningrat palaces. Nowadays, the public is allowed to imitate the king's regalia for attire at wedding rituals and ceremonies. This tradition is still being preserved, as the bride and groom are placed on the day of the wedding reception wearing their best attires (Raffles, 2019). his attire is known as Paes Ageng's bridal dress. *Paes Ageng* has complete components like royal attire, including wearing *kampuh* drapery and complete and full shining make-up (Putri & Sampurno, 2022).

There are differences between agricultural communities in rural areas far from the centre of the kingdom. They create their own bridal attire culture, which originates from instincts that are influenced by surrounding conditions, such as in the Samin community in Dusun Jepang, Margomulyo, Bojonegoro, and Jawa Timur. Samin's teachings are identical to the philosophy of traditional Javanese society in their behaviour and thought concepts (Huda, 2019). Paseksen is included in the wedding ritual tradition. Before 2017, the traditional Samin wedding procession was still closed and not accessible to the public. There is a tradition that the bride and groom must be fellow Samin people. The bridal attire as a marker has not been specifically designed Until 2022, the Jarik Paseksesn Luhur

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6143

drapery, which has philosophical value, will begin to be used to strengthen ancestral teachings about simplicity (Sutrisno, 2024). This phenomenon shows that attire is not just a functional necessity but also a way to convey identity, lifestyle, and values (Qorib, Oktarina, & Ermelinda, 2023).

Attire, as a reflection of identity, status, hierarchy, and gender, has symbolic value and is an expression of a way of life, making it a social and cultural marker (Nordholt, Suffatni, & Aziz, 2005). Nowadays, fashion or attire style is something that is equated with clothing, even though in fact fashion is everything related to the procedure or style of clothing (Rohmah & Legowo, 2022). Fashion is a means of showing the wearer's self-expression, which is influenced by developments in fashion styles. Factors of cultural access, type of livelihood, and environmental conditions of users cause differences in bridal fashion styles. Based on this phenomenon, this paper aims to identify the meaning and symbolic value of the Paes Ageng bridal attire in Yogyakarta and Paseksen Luhur in the Samin community. The identification aims to determine the differences in form, function, meaning, and value contained in the two bridal attire.

2.0 Literature Review

Attire for Javanese people is traditionally synonymous with magical rituals and ethics. Nowadays, there have been changes in form or artistic adjustments to bridal attire. However, the essence of the symbolic meaning and values contained are still there. The Liang Gie (1976) stated that these values include sensory values, form, knowledge, and life. This value depicts that the bride and groom are expected to be able to show brilliance, admiration, wealth of knowledge, and become a successor in the future (Widayanti, 2011).

The habit of dressing neatly is common among the Javanese because dirty clothes are a disgrace (Raffles, 2019). According to Raffles in the History of Java, attire procedures in the 18th century were divided based on the wearer and their use, including daily attire, ceremonial attire, and war attire. Ceremonial attire was neat and luxurious; aristocrats wore cloth called dodot or kampuh, which was made of silk or cotton. At formal ceremonies or weddings, the arms, hands, and parts of the body up to the middle of the stomach are not covered. Women meet the king; their hair is decorated with flowers/jewels. Gold plates or jamming are worn on the forehead, and gold jewellery on the neck and arms is used during wedding ceremonies for men and women..

The inland areas identically far from the centre of the kingdom have their own identity. One of them is in the style of dress of the Samin people who live inland in the national forest area but do not cooperate or work under the company (Asrawijaya & Hudayana, 2021). The conservative community pattern also has an impact on traditional clothing. Until 2017, there was no special clothing for brides; after that, there were special clothing motifs to strengthen the identity of the community (Wardoyo & Wulandari, 2024). This fact is interesting, as there are quite a few significant cultural differences.

One of the differences that is visible in clothing is the aesthetic form of batik motifs as an explicit marker of the symbolic value of clothing. Stylization of natural forms in the real world into ornaments or decorations by simplifying objects (Yunianto, 2018). The stylization of bridal attire highlights the character of every living creature as a form of hope for the wearer. Previous researchers have widely discussed this. One of them is drapery motifs in Paes Ageng Jangan Menir's bridal attire, which use cinder, nick, or glamping motifs. The motif resembles the Chhabadi Bhat motif, which consists of eight lotus petals with various flowers, birds, and leaves curving around the center of the petals. The difference lies in the technique of making it, not weaving but using batik techniques (Setiadi, 2024). The Chhabadi Bhat motif is one of the traditional patola motifs used by brides at wedding ceremonies in India. These eight lotus petals are believed to be the favourite of the Anavil Brahmins and are the eight teachings of Buddhism (Mili, 2014).

3.0 Methodology

This paper uses a qualitative descriptive method because the object of the study is specific. The object of the study is the drapery motif in *Paes Ageng* and *Paseksen Luhur,* with data sources obtained from the Samin community and the Duchy of Pakualaman through direct observation. The research procedure begins with data collection, data processing, data analysis, and data presentation. The data collection stage is through field observations that involve direct roles between researchers and resource persons. Interviews with traditional leaders were conducted internally and in-depth. Literature search of previous research findings in 2024. The collection of data on motif forms, functions, and meanings was categorized based on the urgency of the data and processed into main data. The main data were analyzed into research findings and narrated into research discussions. The presentation of data in the form of pictures, tables, and diagrams presented to provide clear information. This research aims to identify the values contained in the bridal fashion *paes ageng Mataraman* culture in Yogyakarta and *paseksen luhur* in the Samin community as part of the human life cycle ceremony.

4.0 Findings

4.1 *Paes Ageng* Bridal Attire

Paes Ageng attire was created as the regalia of the Kraton Ngayogyakarta Hadiningrat palace. Until the beginning of the 20th century, this attire was only intended for the royal court with regulations of Pranatan Dalem Bab Jenenge Panganggo Keprabon Ing Kraton Nagari Ngajogjakarta Hadiningrat. Royal attire that brides can wear includes Paes Ageng, Paes Ageng Kanigaran, and Paes Ageng Jangan Menir. All three were permitted to be used by the royal family, especially the Sultan's sons and daughters (Widayanti, 2011). In the following period, after Indonesian independence, these clothes and make-up were allowed to be worn by the public as bridal attire.

The types of *Paes Ageng* attire are differentiated by their form and function. Firstly, *Paes Ageng* attire is used during the *panggih* ceremony, a significant event where the bride and groom meet after the marriage contract. In this attire, the bride and groom wear kampuh without tops. Secondly, *Paes Ageng Kanigaran* attire is used during reception ceremonies, with the completeness of this clothing resembling Paes Ageng but with the addition of top clothing in the form of a sikepan for men and a kebaya for women. Thirdly, *Paes Ageng Jangan Menir* attire is worn by the bride during the boyongan ceremony, which involves taking the bride to the groom's residence. This clothing is similar to *Paes Ageng Kanigaran* attire but without the *kampuh*.

The completeness of the *Paes Ageng* bridal attire shows the beauty and majesty of the bride. The groom's complete attire consists of a blue *kuluk*, *cinde slarak kendang* pants, *kampuh* drapery with *semen* motif, *buntal, kamus, lontong cinde*, and *selop* with jewelry of *cundhuk mentul, kalung susun tanggalan, gelang kana, cincin, kelat bahu, sumping, slepe,* and *keris branggah*. For the bride it consists of complex makeup covering *penunggul, wanda luruh, pengapit, penitis, godheg, prada* and *ketep, kinjengan, cithak, jahitan mata, menjangan ranggah, sumping*. The bride's accessories include *gelung bokor, jarik cinde motif slarak kendang*, *kampuh* drapery with *semen* motif, *udet cinde, buntal*, and *selop* with jewelry of *subang ronyok, centhung, cundhuk mentul, kalung susun tanggalan, gelang kana, cincin, kelat bahu,* and *slepe.* This can be observed in Figure 1.

(a) (b) (c)

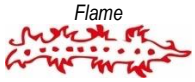
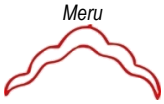
Fig. 1. (a) *Paes Ageng* attire worn by BPH Kusumo Kuntonugroho with Laily Annisa Kusumastuti; (b) *Paes Ageng Kanigaran* attire; (c) *Paes Ageng Jangan Menir* attire.

(*Source: (a)(Karaton Ngayogyakarta Hadiningrat, 2024); (b) (riaspengantinjogja.wordpress.com, n.d.); (c) (Pringgawidagda, 2007)*

One of the distinguishing features of *Paes Ageng* bridal attire from other bridal attire is the use of *kampuh*. *Kampuh* is a batik-patterned drapery used as a body covering for brides, and it has a width of 2 meters and a length of 4 meters (Suharti, 2015). The batik motifs used as *kampuh* are usually semen motifs. This motif has various types, but this article discussed the *semen* king motif. The variety of semen kidang motifs is complete compared to other semen motifs. This motif contains the hope that humans, as perfect creatures of God, must be clever and never give up on achieving perfection in life (*kasampurnaning dumadi*). Details of the shape and meaning of the motifs on the *kampuh semen kidang* can be seen in Table 1. The *kampuh semen kidang* motif is even more beautiful and majestic with the affixing of *prada*. *Prada* is a gold dye that is applied to intricate batik motifs. The gold color in intricate motifs gives a graceful and luxurious effect to the bride who wears it. This clearly shows the hierarchy or social status of the user.

Table 1. The shape of the motif from *kampuh semen kidang*

Motif Design	Type	Meaning
Semen	Main Motif	Living things in the world always bloom and grow. Humans who use it are expected to be able to use their minds to continue to develop their knowledge towards perfection.
Building	Support Motif	Every human being is expected to protect each other in married life.
Gurda and *Lar*	Support Motif	Symbolizes strength, might, and loyalty in life.
Quadruped Land Animals	Support Motif	Science and knowledge as controllers of life from various passions.

Motif Design	Type	Meaning
Air Animals	Support Motif	Humans live as people who always remember that God is the creator of everything.
Flame 	Support Motif	Symbolizes enthusiasm in achieving the expected goals.
Meru 	Support Motif	Mountains are places with various resources that are beneficial to humans but can pose threats so that you remain alert.
Hayat tree	Support Motif	A *hayat* tree as a shelter for various types of living creatures symbolizes the benefits of human life for nature.
Cecek	*Isen-isen*	Symbolizes unity in achieving the main goal of achieving God's approval.
Cecek Sawut	*Isen-isen*	Human life is full of challenges and obstacles in order to achieve perfection in life.

(Source: Writer, 2024)

4.2 *Paseksen Luhur* Bridal Attire

The Samin people believe the wedding ritual tradition, Paseksen, is a sacred traditional procession. The processes carried out have structurally binding rules for social institutions, especially when selecting partners who must be members of the Samin community. Traditional wedding processions held before 2017 were still closed and could only be witnessed by the Samin community. Changes in tradition have occurred since 2018, with the freedom to choose a couple and the opening of the series of wedding processions to the public.

The Samin people have a simple lifestyle. An elder of the Samin community revealed that traditional attire refers to the ancestors, namely wearing black and simple clothes (Rumini, 2024). Attire was explicitly made for brides starting in 2022, namely jarik drapery with the Paseksen Luhur motif. The first use of this attire was by the bride and groom Suyanto and Widyawati (both of whom come from Dusun Jepang, Margomulyo, Bojonegoro). The subsequent use in 2023 will be the couple Riyan Agus Suwarso from Dusun Japan, Bojonegoro and Inggrit Citra Rahmadanti from Ngawi. This drapery was used in 2024 at the wedding between Aning Sungatmi from Dusun Japan, Bojonegoro and Aditya from Sidoarjo..

The *Paseksen Luhur* bridal attire consists of men's and women's clothing. Attire for men consists of *udheng obor sewu* headband, white shirt, and " *jarik* drapery with *Paseksen Luhur* motif. For the bride it consists of a *sri kuncoro* shawl, kebaya, and *jarik* drapery with *Paseksen Luhur* motif. The *jarik* drapery with *Paseksen Luhur* motif is rectangular in shape with a width of 110 cm and a length of 245 cm. The variety of motifs consists of the main motif (*cempaka mulya*), supporting motifs (*mimi lan mintuno* and *jati* leaves), and *isen-isen* (*cecek kepyur* and *cecek grompol telu*). This motif aligns with Samin's third noble statement, namely that all humans on earth are equal before God and are brothers (*ojo mbedo mbedakne sapodo padaning urip, kabeh iku sedulure dewe*). Details of the form and meaning of the motifs are in Table 2.

Table 2. The shape of the motif from *Paseksen Luhur*

Motif Design	Type	Meaning
Cempaka Mulya	Main Motif	Determination to achieve the goal of married life, based on love, mutual respect and complementarity.
Mimi lan Mintuno	Support Motif	Describes animals that always pair together for life and death. Interpretation of the symbol of indivisible unity.
Jati leaves	Support Motif	the value of gratitude for the abundance of blessings from the earth's products which are useful for the continuation of life.
Cecek Kepyur	*Isen-isen*	the value of responsibility for completing work as a mandate that is carried out.
Cecek Grompol Telu	*Isen-isen*	the value of simplicity, thoroughness, caution in carrying out work.

(Source: Writer, 2024)

There is meaning in every part of the *Paseksen Luhur* bridal attire. The groom's attire is udheng obor sewu, and udheng is a headband, understood as mudheng, which means understanding (Wardoyo, 2019). Its use on the head means this organ's glory, the brain's location, and the centre of consciousness and inner thought for humans as creatures created by God that differentiate them from other creatures.The bride's attire consists of a *sri kuncoro* shawl, hair neatly loose or simply tied, a black kebaya, and *jarik* drapery with *Paseksen Luhur* motif as a bottom. The simplicity of bridal attire in Samin traditions reflects the superficial character of the life of the Samin people. Samin women represent a local community because they choose to live with their community group in a close inland place in a powerful system.

There are rules for using the *jarik Paseksen Luhur*. For brides, it is generally the same: the number of *wiron* of seven folds, the style of tying at the stomach using a *stagen*, and the bottom border above the ankles. Difference in fold direction, if a man folds from left to right, the right front view is the *wiron* position. For the bride, the direction of the folds is from right to left, the left front view is the *wiron* position.

5.0 Discussion

The bridal attire of *Paes Ageng* and *Paseksen Luhur* has magical and ethical meanings. The meaning is material and spiritual, which can provide value for those who wear it and those who see it. This is still in line with the culture of dressing since ancient times. Even the style of dress has spread to various corners of the region, although it has different styles. An example is what happens in the Samin community with the Paseksen Mulia bridal attire.

Fig. 2. The bride and groom use jarik *Paseksen Luhur*
(*Source: Writer, 2024*)

The two bridal attires have *luhur* values that are specific to the bride. Transitions in each phase of human life sometimes place humans in a vulnerable, weak, or critical position. Marriage is a marker of changing phases of the human life cycle from adolescence to adulthood. This phase is a sacred moment that is expected only to be passed once in a lifetime. This moment's importance means that you must prepare thoughtfully and carefully to step on it to achieve safety (Suwito, Adrianto, Baroroh, & Nurwanti, 2009). An explanation of the symbolic values is presented in Figure 3.

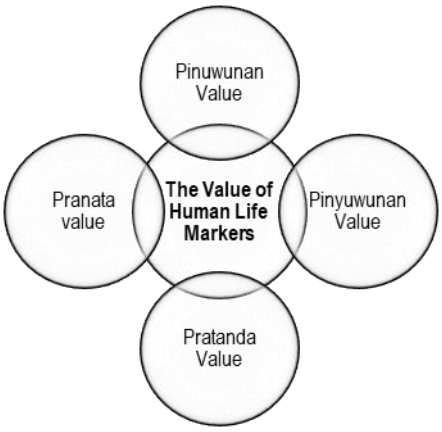


Fig. 3. The Value of Human Life Markers
(*Source: Writer, 2024*)

There are symbolic values in the *kampuh semen kidang* and the *jarik paseksen luhur* as part of bridal attire in Java. These values include *pinuwunan* (expressing gratitude), *pinyuwunan* (suplication), *pratanda* (marker), and *pranata* (preparing for the future) (Gamayanti, 2024). The explanation of these values is as follows,

5.1 *Pinuwunan* Value

Expressions of gratitude (*pinuwunan*) are poured out by the bride's family, especially the bride and groom's parents. Thanks to the parents' hard work in educating and providing for all their needs, the children they cared for arrived to start living independently. The provisions for the future life of the bride and groom are depicted in the various drapery motifs in batik.

5.2 *Pinyuwunan* Value

The supplication (*pinyuwunan*) is explicitly drawn from the variety of motifs. The golden and bright colors in *semen kidang* are an expression of hope for the brilliance of the future. Meanwhile, the dark-colored *jarik Paseksen Luhur* represents simplicity and inner calm. Both symbolize the hope for the bride and groom in the future of achieving brilliance in marriage, ease of sustenance, having intelligent and virtuous offspring, and being able to uphold the status of their extended family.

5.3 *Pratanda* Value

Markers (*pratanda*) based on attire designation. *Kampuh semen kidang* is a royal regalia that shows the specialness of a bride, like a king at the wedding. *Jarik Paseksen Luhur* has a philosophical value that strengthens ancestral teachings about simplicity and marks the Samin community's openness to responding to current developments, especially when choosing a life partner. Inwardly, this clothing marks a change in a human phase, from cheerful adolescence to responsible adulthood.

5.4 *Pranata* Value

Pranata, this bridal attire symbolises that future life is full of challenges and temptations. These temptations are wealth, women, position, and others. The hope is that by wearing these clothes, the bride and groom can act in a straight line according to norms. No matter how beautiful the attire is, if they cannot maintain the honour, they make the wearer despicable.

6.0 Conclusion & Recommendations

Marriage, as part of the marker of the changing phase of the human life cycle, becomes a sacred event full of hope. Javanese bridal fashion is designed in such a way as to provide advice and a picture of the life that the couple will live in the next life. The bride, likened to the main character in the marriage life cycle ceremony, is depicted in the clothes she wears, which are full of symbolic meaning. One of the symbolic meanings and values is contained in the kampuh cement kidang cloth as part of the paes ageng bridal outfit and the *jarik paseksen luhur* which is part of the *paseksen luhur* bridal outfit of the *Samin* community.

The object of this study is limited to *kampuh semen kidang* fabric in *paes ageng* bridal wear and *jarik paseksen luhur* fabric in *paseksen luhur* bridal wear of the Samin community. This study has a limitation on strengthening the meaning and symbolic value of marriage as a marker of changing the phase of the human life cycle from adolescence to a sacred adult. The implementation of a sacred wedding ceremony is passed once in a lifetime.

Further studies are needed on the objects of batik fabrics or Indonesian wastra used in other traditional wedding outfits in various regions. The phenomenon of cultural shifts in the use of traditional clothing in the general public, some of which still maintain the rules of the pakem and some have undergone changes in the way of dressing. This is an opportunity for future studies, especially the study of symbolic meaning in the traditional wedding ceremony and its complement.

7.0 Paper Contribution to Related Study

This study contributes to discussing the meaning and symbolic value of marriage as a marker of changes in the sacred phase of the human life cycle, especially in the *paes ageng* bride and the *paseksen luhur* bride of the Samin community. Both have the same depth of sacred value of marriage as a marker of life cycle phase changes. The holy values are summarized in the expression of the value of *pinuwunan* (expression of gratitude), *pinyuwunan* (request), *pratanda* (sign), and *pranata* (preparing for the future). *Paes ageng* bridal attire has become the standard and reference dress in the traditional wedding tradition in Yogyakarta and Central Java. This study provides insight into the traditional wedding traditions of a pair of *paseksen luhur* brides of the *Samin* community in Bojonegoro, East Java. The display of simplicity in dressing using *jarik paseksen luhur* is able to represent the symbolic values of the life of the *Samin* people.

References

Asrawijaya, E., & Hudayana, B. (2021). The Power of a Leader in the Samin People's Opposition Movement to the Development of a Cement Factory in the North Kendeng Mountains. *Jurnal Humaniora*, *33*(1), 26-38.

Gamayanti, I. L. (2024). *International Symposium on Javanese Culture 2024: Traditional Ceremonies in the Sultanate of Yogyakarta*. Yogyakarta: Not Published.

Huda, K. (2019). Menjadi Jatmika; Nilai Kejatmikaan pada Perempuan Samin di Kabupaten Bojonegoro. *TOLERANSI, 11*(2), 173-189.

Karaton Ngayogyakarta Hadiningrat. (2024). Sri Sultan Hadiri Pernikahan Putra Bungsu Adipati Pura Pakualaman. Retrieved from Karaton Ngayogyakarta Hadiningrat: *www.kratonjogja.id*

Mili. (2014). Symbolic forms and Motifs in Patola Saree of Gujarat. *Asian Resonance*, 240-243.

Nordholt, H. S., Suffatni, R., & Aziz, M. (2005). *OUTWARD appearances trend, identitas, kepentingan*. Yogyakarta: LKIS.

Pringgawidagda, S. (2007). *Mengenal Busana Pengantin Gaya Yogyakarta*. Yogyakarta: AdiCita.

Putri, V. A., & Sampurno, S. R. (2022). Perubahan Paes Ageng Keraton Yogyakarta 1900-2005. *Bandar Maulana Jurnal Sejarah Kebudayaan, 27*, 12-21.

Qorib, F., Oktarina, R. A., & Ermelinda, J. (2023). Penggunaan Busana Sebagai Bentuk Ekspresi dan Identitas Mahasiswa di Media Sosial. *Jurnal Komunikasi Nusantara, 5*(2), 236-251.

Raffles, T. S. (2019). *The History of Jawa (terjemahan) Cetakan 7*. Yogyakarta: Narasi.

Rohmah, D. F., & Legowo, M. (2022). Fenomena Lunturnya Tradisi Jawa dalam Bidang Fashion Akibat Modernisasi. *Jurnal Ilmu Sosial Humaniora Indonesia*, *2*(2), 69-74.

Rumini. (2024). *Interview Busana Adat Masyarakat Samin*. (S. Wardoyo, Interviewer)

Setiadi, D. O. (2024). *Kain Patola : Akulturasi dan Makna Simbolik dalam Busana pengantin Nusantara*. Yogyakarta: Report.

Suharti, T. (2015). *Bedhaya Semang Keraton Nyagogyakarta Hadiningrat: Reaktualisasi Sebuah Tari Pusaka*. Yogyakarta: Kanisius.

Sutrisno, B. (2024). *Interview Ajaran Luhur Samin Surosentiko.* (S. Wardoyo, Interviewer)

Suwito, Y. S., Adrianto, A., Baroroh, R. U., & Nurwanti, Y. H. (2009). *Upacara Daur Hidup di Daerah Istimewa Yogyakarta Jilid 2*. Yogyakarta: Dinas Kebudayaan Provinsi Daerah Istimewa Yogyakarta.

Wardoyo, S. (2019). Motif Batik untuk Udheng Masyarakat Samin Dusun Jepang Kabupaten Bojonegoro. *Proceedings 3rd International and Interdisciplinary Conference on Arts Creation and Studies 2019*. Surakarta: IICACS.

Wardoyo, S., & Wulandari, T. (2024). *Wastra Batik Paseksen Luhur*. Yogyakarta: Report.

Widayanti, S. (2011, Desember). Tinjauan Filsafat Seni terhadap Tata Rias dan Busana Pengantin Paes Ageng Kanigaran Gaya Yogyakarta. *Jurnal Filsafat*, *21*(3), 240-256.

Wijanarko, F. (2021). Wastra Langkara, Literasi Busana Bangsawan Yogyakarta. Jakarta: Perpusnas Press.

Yunianto, P. (2018). The Iconic Stilation Of Molioboro Street Furniture. *Jurnal SULUH*, *1*(1), 106-121.

riaspengantinjogja.wordpress.com. (n.d.). Retrieved from Roemah Rias Arnie Suryo: https://riaspengantinjogja.wordpress.com/portofolio/mf5_9699rp-rs/

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Ansel Adams Easton Study of Work, Artistry, and Social Aspects

Irwandi[1*], Siti Norfatulhana Ishak[2]

**Corresponding Author*

[1] Photography Department, Faculty of Recorded Media Art ISI Yogyakarta, Yogyakarta, Indonesia
[2] Creative Photomedia Department, College of Creative Arts, Universiti Teknologi MARA, Malaysia

irwandi@isi.ac.id, sitinorfatulhana@uitm.edu.my
Tel: +6281328656252

Abstract

The fame of an artist is sometimes recognised as a reflection of himself and his work features alone. The artist's popularity and several socio-cultural factors affect recognition and reputation. Ansel Adams is an example of how the position of an artist in the constellations of socio-cultural America. The beautiful, good concept and technical abilities of Ansel Adam's work put him in a social folder of his era. The article will discuss his work side; the capacity and roles deemed external helped push his popularity. From this perspective, we will see how social factors are essential in maintaining an artist's existence.

Keywords: Photography; Ansel Adams; social aspects

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open-access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6146

1.0 Introduction

Adams is one of the big names in world photography, specifically black and white photography (black and white photography). This American photographer was born in 1902 in San Francisco and died in 1984 in California. Almost all of his photos have natural landscape themes (*landscape*) and Photo natural objects (*still life*). Adams lots produces works about natural beauty, especially the beauty of Ansel of Yosemite National Park and other national parks in America.

Adam was recognised for his technical abilities in photography, especially in matter sharpness drawing, and the ability to produce smooth monochromatic gradations in each of his works. Together with other photographers, such as Imogen Cunningham, John Paul Edward, and Edward Weston, he founded a photography club called "f/64" (Barr, 2000). Club This popularised the dogma of producing photos with maximum sharpness and detail. Term f/64 Alone is a technical term for shooting, which means using a diaphragm 64 in every photo shoot. Technically, in photography, the higher the diaphragm number used (the smaller the aperture), the wider the area of sharpness produced and the appearance of a photo.

Adams published several books related to photography works and techniques during his life. Books entitled Making a Photograph (1935), Adams's Sierra Nevada (1938), Yosemite Valley (1959), The Camera (1980), The Negative (1981), and The Print (1983) are part of the result of Thinking And his work. Wrong One big donation Ansel Adams on world photography is the discovery of the zone

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6146

system method in 1941, a method to help the photographer determine the exposure on moment shooting and film development time to produce gradations image optimal (Bieger-Thielemann, 2005, p. 19). As a photographer with technical abilities, Adams was also instrumental in establishing the Department of Photography at the California School of Fine Art in 1946 at the request of Ted Spencer, President of the San Francisco Art Association.

In 1946 and 1948, Adams received awards from the Guggenheim Foundation. He is also the only photographer to have taken self-portraits for the cover of Time Magazine (September 3, 1979 issue). Towards the end of his career (1980), Adams was awarded the Medal of Freedom from then-American President Jimmy Carter for his contributions to American photography and the preservation of cultural heritage.

That same year, Adams was entrusted with creating formal portraits of President Jimmy Carter and Vice President Walter Mondale that would be displayed at the National Portraits Gallery. First, it uses photography as media for immortalising national figures. Previously, there was a tradition of making portraits of American national figures. For interest files, the country always uses painting. Year next, Adams printed and recorded new in-sale photography works, namely one of his "Moonrise", sold for $71,500 or around 650,000,000 IDR, the highest price for a photo print. The same year, Adams was also awarded the Hasselblad Medal of Honor from the King and Queen of Sweden. The awarding ceremony was held at the Museum of Modern Art in New York. Hasselblad is brand the world's leading camera trader.

Another form of appreciation for Adams is celebrating the year 80, held at the Monterey Peninsula Museum of Art. The event included a piano performance by Vladimir Ashkenazi. One year before his death, Adams had time to exhibit in Shanghai, China. The exhibition was the photographer's first time America had been invited since the collapse of the communist in China. He was also interviewed by Playboy Magazine. In the interview, Adams conveyed his criticism of American President Ronald Reagan regarding environmental policies. Reagan then responded to Adams' criticism of him by allowing Adams to come to the White House and convey his ideas on environmental issues.

Even though he died in 1984, Ansel Adams' popularity has not faded. He has become a legend in the photography world. His work has still become a "commodity", selling well on the market. Many galleries offer Adams' works, both originals and reproductions. Adams' work is sold as postcards, calendars, posters, and other products. Marketing of his works also utilises internet technology so that collectors can order Adams' works online.

Adams is also known as an artist and environmental activist in their country of origin, and he is appreciated for his works' brilliance and concern for the environment. In Indonesia, the name Ansel Adams is familiar to photographers, academics, professionals and hobbyists, especially black and white photography. The general assessment of the Indonesian photographic public towards Adams' work tends to emphasise the beauty and the technical perfection produced through the zone system method. Arbain Rambey, in the Monday, July 21 edition of Kompas Daily 2003, presented his opinion of Adams. Ramsey indicated that what Adams had achieved so far resulted from perseverance and hard work in the field and the darkroom.

Adams' popularity was not without criticism. The great French photographer Henri Cartier-Bresson rebuked it. In Rambey (2003: www.kompas.com), Bresson said: "The world is very diverse. What was photographed Adams and Weston are just that coral and tree". On the 100th anniversary of Ansel Adams, several galleries in the United States show off his works. Several office news even sent pictures of Adams to the newspaper he subscribed to.

Ansel Adams' popularity worldwide is an exciting phenomenon. Remember that lots achieved a performance that no other photographer has achieved. His photography reputation earned him various honours at several art events and statehood. Adams' works have also been cited as icons for America and the technical purity of photography.

2.0 Literature Review

2.1. Social Factors That Role An Important Role In Raising The Popularity Of Ansel Adams And His Works

As described, exciting facts and phenomena about Ansel Adams are the starting point for studying the art of photography, which will be done by inserting loads of discussion. This is done based on the initial assumption of success. Ansel Adams is not only understood solely because of his work's beauty, but social factors also influence it. For this reason, this article assumes that Adams's success and performance resulted from various devices and conditions of social life at that time. This assumption does not rule out facts about the beauty and characteristics of Adams' works, so the analysis of the work is through observation and description of the elements. Visual work by Ansel Adams will be done first before going into sociological issues and social aspects, explaining factors important in raising the popularity of Ansel Adams and his works. In this context, two factors will be studied: internal factors, which come from within the artist, and external factors, in the form of social aspects, which influence Ansel Adams and his work.

2.2. Various Approaches

2.2.1 The Visual Elements

Gene Markowski's opinion in the book The Art of Photography: Image and Illusion (1984:70-140) regarding the visual elements of photographic works will be used as the primary source in analysing the formal aspects of Ansel Adams' work. Markowski classified ten element visual elements that affect the visible quality in photographic works, namely light (light), tone (tone), shadow and soft shadows

(shadow and cast shadow), shape (shape), line (line), texture (texture); size (scale); perspective (perspective); space (space); and composition.

2.2.2 Art and State

The external factors that played a role in raising the popularity of Adams and his work will be analysed using the sociological approach to art and the state that Howard S. Becker puts forward in his book entitled Art World (1982). Becker (1982:165) states, "State and government apparatus through which they operate, participate in production and distribution of art within their borders ". This statement shows that the state and its instruments participate in producing and distributing works of art which are acceptable according to specific standards. In this case, the state has the strength to monopolise the circulation of works of art by state interests alone. Intervention in the art world is becoming essential to guard the productivity of artists oriented towards state interests. Besides that, Becker (1982:166) also views that a country's political leaders often use symbolic representation to mobilise the public for a specific purpose.

According to Becker (1982:180-191), there are two forms of intervention in the world of art, namely, in the form of support and censorship. Support from the state can be in the form of "reviving" museums, support for artists, art educational institutions, exhibition space, publications, scholarships and assistance. The connection of mutual benefit will be evaluated for its sustainability based on the results achieved. If the results of support for artists are deemed successful and in line with the state's interests and need to be continued, the support will be guaranteed to be sustainable. Through the apparatus, the country has a significant role in raising an artist's popularity.

3.0 Discussion

3.1. Description Of Ansel Adams' Work and Phenomenon from A Social Perspective

3.1.1 Formal Aspect in Ansel Adams' Works

The discussion of element visuals will be more effective if done simultaneously, considering each visual element is interrelated and influences each other. Adams fully utilises natural light sources, namely the sun (available light). The direction of light always comes from the side of the shooting object. Such lighting can be found in the morning or evening when the sun is leaning towards the east or west. Light side effects will generally strengthen the character of the subject. This is when Schaefer said that " side lighting usually enhances the visual impact of a subject". John Garret strengthens Schaefer's previous statement in the book The Art of Black and White Photography (1990:26) by stating that morning light can display " ...sharp, hard-edge results". Moreover, Adams is one of the figures in the f/64 club who is committed to photographing with a small aperture to produce sharp photos (sharp focus style). The photographer's sensitivity in "reading" the direction and quality of light will produce a Photo With certain impressions such as dramatic, eerie, peaceful, gentle, romantic, spiritual, and so on (Markowski, 1984, p. 82).

The lighting conditions Adams chose directly affected the element's visual other. Unlike light during the day, which has a harsh character, the side light in the morning, which has a soft character, produces firm shadows but does not eliminate the object's detail on the part highlights and shadow. This will bring out the texture and enrich the tonal variations of the objects displayed. Besides that, light from the side will also highlight the dimensions/ form of the object that hits it. Thus, one frame of Adams' work contains various visual elements that finally become characteristic and appealing.

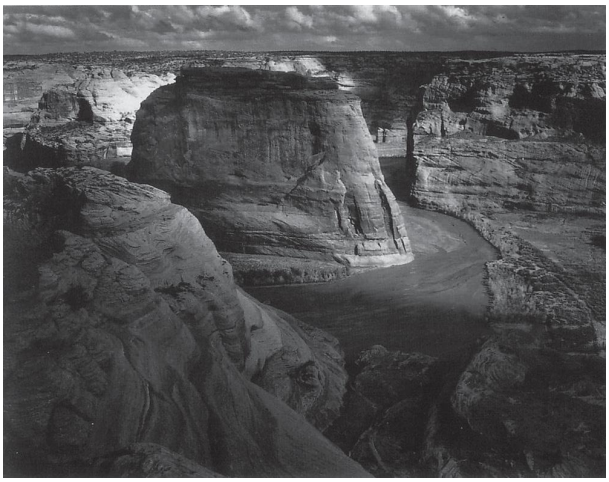


Fig. 1: Canyon de Chelly
(Source: National Museum 1942)

Composition photography is influenced by forms of composition from art painting, especially Renaissance-style painting (Markowski, 1984, p. 137; Garret, 1990, p. 37). However, since the telephoto lens and wide-angle lens were discovered, the photographic composition has received improvements in treasury composition. Tele Lenses can compress the perspective or "bring closer" the distance of the main object to the background. On the other hand, a wide-angle lens can produce a visual appearance in which the

background behind becomes farther from its original state to give the impression of breadth. The working title ”Canyon de Celly” in Figure 1 shows the visual effect produced by a wide-angle lens. The vastness of nature becomes prominent in the work. The lens is corner-wide, affecting the scale of the objects displayed. The scale and perspective that appear are different from those produced by man. Adams' other works also utilise aerial perspective to emphasise the impression depth/ spatiality of the shooting object.

The element line that comes on stage most stands out: the horizon line that limits the sky area and earth. With a composition like That, Adams gave a more significant portion to the earth element. The earth element also contains various line elements. It is full of combinations of vertical, horizontal, curved, and irregular broken lines.

From the description above, it can be seen that the element of light becomes variable and significant in realising his work. Light is an essential factor that influences the character of tone, shape, texture, and form that is visible in a photo. Tone will produce a certain " mood ", while texture will increase a photo's " degree of realism ". Adams also paid great attention to composition. It was done with an election lens angle, angle of view, and the dominance of certain objects in the field of his works. To describe the impression and value of Adams' work, Soeprapto Soedjono's (2006:10) opinion that Adams's mark aesthetic is ”vastly enigmatic”.

3.1.2 The Ansel Adams Phenomenon in Social Perspective

When Ansel Adams name appeared and was heard by the public when his work about Yosemite National Park was published in the Sierra Club Bulletin in 1920. The management of Sierra Club, a club tour and lover/conservationist nature famous in America, paid particular attention to Adams' work. In 1926, it supported publishing an album containing photos of national parks (www. pbs.org). In this album, Adams begins to show his potential abilities in photography. From a sociological perspective, the starting point that most determined the continuity of his career was when he received support from an art patron named Albert Bender in 1927. This way, his works could be distributed to the audience, and Adams would be well-paid. This is proven by the photos used as illustration writing and poetry by Robinson Jeffers and Mary Austin.

Ansel Adams' meeting with senior photographer Alfred Stieglitz in 1933 was also crucial in his career. From that meeting, Stieglitz recommended and promoted Adams for exhibiting a single in Studio an American Place, New York. The subject matter that Adams chose to characterise his work significantly contributed to his career outside of photography. In 1932, Adams was elected director of the Sierra Club (Turnage, 1980). Under the auspices of this club, Adams had the opportunity to present his works related to the natural beauty of the National Park at the conference of National and State Park at the invitation of the Secretary of the Interior and Agriculture in Washington, DC. The Sierra Club submits a proposal to legalise the Kings River Sierra area as a national park. Presentation of the No resulted in an agreement regarding the inauguration of the Kings River area Sierra as a national park. However, due to Adams' presentation at the event, Adams was entrusted by Charles L. Ickles to create a photo mural that would be installed in the interior department.

Feeling the target was not yet achieved, the Sierra Club kept trying by subsidising Ansel Adams to publish a limited edition book, Sierra Nevada: The John Muir Trail. The book was sent to various parties, including President Franklin D. Roosevelt. The idea of establishing the Kings River Sierra area as a national park got a positive response from President Roosevelt and Ickles. With the hard struggle of Roosevelt and Ickles, the idea was finally approved by the American Congress in 1940. This success was the result of the Sierra Club's patronage of Adams. Since that success, Ansel Adams has emerged as a figure who was respected by the American public, as stated by Peter Barr (2000: “After playing a central role in establishing Kings Canyon National Park, Adams became widely regarded US the principal photographer of, and unofficial spokesperson for, the National Park system“.

This momentum made Adams a photographer with new powers. The death of his art patron, Albert Bender, in 1940 did not affect the popularity of himself and his work. Adams' work promotes the theme of America's natural beauty, which has led him to activities outside photography. With his photography theme, Adams entered the political environment with a mission to preserve the environment. Armed with the organisation's work and support, Adams succeeded in making "political contacts" with decision-making parties. This helped increase Adams' popularity and reputation in photography and nature conservation. This is proven by Adams' many activities related to the state and nature conservation.

In 1965, Adams was invited by President Lyndon B. Johnson to discuss environmental issues. As a result, the book A More Beautiful America was published by Adams and Nancy Newhall. Points important from publishing the book are what happens in the distribution of works Adams, accompanied by writings by President Johnson. This means the works produced by Adams have become part of state missions related to the environment. From then on, Adams was not only by the club but also by his country. Adams' work has a symbolic value connected to American politics, economics, society and culture in this context. Achievements Adams is based on the theory about the relationship between art and the state put forward by Becker, namely that the state often uses works of art to symbolise something. This way, artists whose work aligns with the state's interests will get more opportunities than other artists.

Siple, Ashley (2002), discloses that:

> “Ansel Adams's documentation of the Western landscape has taken on iconic significance as one of the defining purist visions of the American West and photographic medium…..”

Adams' photographs benefit the American government, namely iconic value regarding America's natural beauty and economic value. Adams' photographs are promotional media for tourist objects like Park National in America. Since 1940, visitors park national in America; the number has increased to over one million visitors yearly. That amount continued to increase in the following years (Grene, 1987, p. 752).

Because it was considered profitable for the government, it was not surprising that Adams had the opportunity to exhibit in various art galleries and museums, which were prestigious in America, as well as had the opportunity to meet directly with several American presidents, such as Roosevelt, Johnson, Carter, and Ronald Reagan. Adams' busy solo exhibition activity certainly also strengthens his position as a photographer and photographic artist, considering that almost all of his exhibition venues are places that have a good reputation. It sounds like MOMA (Museum of Modern Art) and the de Young Museum.

4.0 Conclusion

The visual element that stands out in Adams' work was an essential factor in supporting the brilliance of his career. Adams' work aligned with state policy was a significant strength for him and benefited the Sierra Club. With that, he has a path—distribution channels that are increasingly wider and possible for spreading influence at the government level.

After having a stable power and position, Adams' famous name was carried by various parties for interest. An example is when Kodak film producers trusted Adams to advertise their products. Adams's photography techniques, the concept of his work, and his social skills have made him an artist worthy of the title of an integrated professional artist. From the technical side of photography, Adams, with his zone system, demonstrated to the audience that photography has extraordinary visual appeal. The photo's " ordinary " theme inspired many influential parties at the executive level. His ability to socialise well, direct or through symbolic contacts, made him well-known to the public. Success Adams was deeply influenced by factors relating to the social, political, economic, and cultural conditions of the United States at the time.

This case can be seen from two sides. On the one hand, it shows that artists need support from the social structure surrounding them. The theme is considered “ordinary,” nothing special, or just seen as a photo. "Trees and coral reefs can become outside the ordinary when taller social solids intervene. On the other hand, the perpetuation of artistic touch and flair in the artist's work can penetrate the thick partitions of bureaucracy and the social system.

Undoubtedly, Ansel Adams was famous in America for the government's remuneration for donations to Adams to his country. However, this conclusion still provokes another question that challenges the author to find the answer: Why is Ansel Adams also famous in Indonesia?

References

Siple, A (2002).www.mocp.org.

Barr, P. (2000). Ansel Adams: America's Saint George of Conservation. http://www. hctc.comment.edu/artmuseum/ anseladams/barresay.html .

Becker, H. S. (1982). Art Worlds. California: University of California Press.

Bieger-Thielemann, Mariane. (2005). 20th Century Photography: Museum Ludwig Cologne. Cologne: Taschen GmbH.

Garret, J. (1990). The Art of Black and White Photography. London: Reed Consumer Books Ltd.

Greene, L. W. (1987). Historic Resource Study, YOSEMITE: THE PARK AND ITS RESOURCES, A History
Of the Discovery, Management, and Physical Development of Yosemite National Park, California, US. Washington DC: Department of the Interior/National Park Service.

Markowski, G (1984). The Art of Photography: Image and Illusion. New Jersey: Prentice Hall Inc.

Soedjono, S (2006). Pot-Pourri Fotografi. Jakarta : Universitas Trisakti

The Sierra Club Bulletin. (1920). www.pbs. org.

Turnage. (1980). www.205.178.161.74/content/ansel_info/ conservation.html.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta
https://arcadesa.isi.ac.id/index.html
8th Art, Craft and Design in Southeast Asia International Symposium
ISI Yogyakarta Indonesia, 27-28 September 2024
Organised by: Institute Seni Indonesia, Yogyakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Art and Activism: Artists amid social, environmental, and cultural crises

Suwarno

Fine Art Department, Faculty of Visual Arts and Design, ISI Yogyakarta, Indonesia

suwarno.wisetrotromo@gmail.com
Tel: +62811251037

Abstract
Social, environmental, and cultural crises are no longer an issue but a worrying reality. In macro phenomena, it manifests as a crisis of ethics-morality, radicalism, intolerance, and rejection of diversity. This situation requires extra handling in all spaces, lines, and professions. During an extreme situation, artists and art education, along with works of art, crafts, and design, are not enough to dwell in the aesthetic, artistic, and esoteric area, let alone just for economic interests but must participate actively, concretely, build networks to carry out adaptive-innovative collaboration, to be able to be part of the solution.

Keywords: Art activism; social and cultural crisis; environmental crisis; adaptive collaboration

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6349

1.0 Introduction

Art, crafts, and design, in their diverse forms of thought and practice, have the potential to serve as a powerful medium for driving community participation. They can effectively respond to various social, political, economic, and cultural problems. Various arts, crafts, and design practices create opportunities to engage different segments of society. Participatory art and design models (Aspinall, 2012; Moelyono, 1997; Yangni, 2012), as demonstrated by individuals (artists) and communities, have the power to inspire others to join in efforts for improvement and change. The spirit of activism that underpins art and design practices, rooted in real and contextual issues, is particularly potent when it aligns with the interests of society.

Therefore, building a shared understanding involving many parties related to such issues amid increasingly boisterous and individual life dynamics is not always easy. It is essential to take a specific, enlightening, and fun approach, one of which is through thinking and art-craft-design activities. Art/practice of art and design provides a playground and a space to build a form that is assumed to be engineered to form a harmonious structure (object, work).

The playroom accommodates the essential human character as homo ludens, as the player's creature that plays the game (Johan Huizinga; 1938). Huizinga argues that play is a natural phenomenon that animates culture (journal.unpar.ac.id; upload on 20 September 2024, jam 13.15). Playing activities also contain assumptions or dreams of the perpetrator (the player) of something – form or value – that has joy, unity, and harmony. Meanwhile, in everyday reality, life is a drama of sorrow and joy; daily life is also a whole of plans, calculations, profit and loss, and others; and harmony is limited to ideals because reality often shows the opposite (Disharmony).

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6349

However, play and games are two forms of media that simulate life; there is a game and reality. In this regard, art and design need to be used more as a media for activism, a medium to mobilise many parties interested in making changes for a better life together. Perspective and critical attitude are essential. Participation and emancipation became models of approach, as Adorno and Horkheimer argued that art had lost its emancipatory power. For these two critical thinkers, Adorno and Horkheimer, as concluded by Saras Dewi, art is not only about artistic satisfaction but can also be essential to reality (Dewi, 2022).

The practice of fine arts, crafts, and design that departs from the surrounding reality, awareness of using materials that aim to take care of the environment, maintain sustainability, have potential economic value, independence, and organic, will encourage the creation of a systemic ecosystem. The end of achievement is a positive identity that is the citizens' pride. Pride in being independent and contributing to creativity and the universe's safety.

2.0 Literature Review

Related actual and contextual issues: (1) Social crises, for example, the emergence of extreme polarisation in society due to political practices, manifested in the form of persecution, intolerance, and the like, exacerbated by social media. The collapse of expertise has plagued educational institutions amid such rapid and disruptive development of science, art, and technology; (2) Environmental crises afflicting nature (deteriorating water, soil, ecology, food, health, air, and others). Development in all sectors by ignoring environmental processes and safety is a trigger for an increasingly severe crisis; (3) Cultural crises can be seen and experienced in the form of crises of values/morals, ethics, manners, and the like in daily life practices (social, political, economic, community). Observing such aspects is essential to understanding the practices of art, crafts, and design that go through the process of research, collective work, and collaboration, including cross-disciplinary work (Hyphen – Ratna Mufida, Pitra Hutomo, Grace Samboh, Rachel K. Surijata; Editor, 2023; Kent, 2024).

3.0 Methodology

This research relies on the philosophy of qualitative research, using interpretative methods on how the practice of fine arts, crafts, and design can be used (potentially) as part of the solution to social, environmental, and cultural crises. The solution can be participatory-emancipatory art practices, which move crowds, communities, or societies.

Qualitative methods are practised through observing the subjective experiences and ideologies of fine arts artists, crafts, and designers who work by involving society, citizens, or communities. Of course, art education institutions are part of what is observed, primarily through the curriculum and the classes. This research wants to show how art/artworks, crafts, and design have the opportunity to respond to social, environmental, and cultural crises in the form of being part of the solution.

Close observation was carried out on three (three) works/events of art, crafts, and design: Harvest Apa Today (PAHI) by Anang Saptoto; IBU (Imah Seni Cegondewah) by Tisna Sanjaya and the Yogyakarta Cultural Festival (FKY) organised by the Yogyakarta Special Regional Government (DIY) through the DIY Cultural Office (Kundha Kabudayan). The three research subjects were presented with data through photographs of works and photos of event documentation.

4.0 Findings

4.1 What Harvest Today

The art project, or precisely the Harvest What Today (PAHI) art activity, is used as a case study of how art is part of the solution to the social crisis. Starting from the impact of the state project to build the Yogyakarta International Airport (YIA) around the southern coast of Kulonprogo Regency, there was turmoil among farmers who lost their agricultural land. The next problem is the COVID-19 pandemic from March 2019 to 2022, causing a crisis in farmers' lives. Farmers who can still cultivate the land originally became suppliers of food ingredients for the culinary industry (restaurants, hotels, cafes), including supplying shops, losing customers. Crops cannot be distributed to regular consumers.

This condition aroused Anang Saptoto, an artist and photographer active in the photography collective Mes 56 Yogyakarta, to take the initiative to help farmers directly distribute crops in the form of vegetables, bananas, mango, cassava, and the like to households. Anang Saptoto made digital advertising posters, distributed them to his colleagues, offered crops, and delivered them directly to his home (Wisetrotomo, Pradani Ratna, 2022)—a touching humanitarian philanthropic movement.

The posters were humorously designed and titled What Harvest Today (*Panen Apa Hari Ini*-PAHI). The poster was designed by processing photos by Anang Saptoto. The first poster combines a half-body figure, from the face to the waist, and pictures of agricultural or livestock products (such as eggs, fruits, vegetables, etc.). This poster informs that the faces in the poster are producers (farmers, ranchers), like the photos connected to the lower part of their bodies. The second type of poster combines the product with the lower body. This poster shows the figures of users (customers, shown without faces) of the farmers' products. The third type of poster is a product advertisement that uses unique names on each product along with prices (units, kilos, bundles, and the like). For example, *Bawang merah lubang tambang semakin parah; Bawang putih hatiku bersih; Singkong ketan mbok yang toleran; Tomat buruan tobat, etc.)*

Such an approach creates a unique relationship between farmers, customers, and distributors (in this case, Anang Saptoto), creating excitement. Photographed and then printed, even in the form of widely circulated posters, it was a unique experience never imagined

by farmers, including customers. Using social media, the unique advertisement is spread to potential customers, customers order the desired products, and the ordered goods are quickly delivered to the customer's home. Social restrictions during the Covid-19 pandemic opened up unexpected business opportunities. Another side effect was that the posters were gifted to "farmers" and sold to anyone interested in collecting.

4.2 Imah Budaya (IBU) Cegondewah

IBU (Imah Budaya) Cegondewah is an example of a case of art practice model as part of the solution to the environmental and cultural crisis. Tisna Sanjaya is an artist, social, political, and environmental activist working in art with a multi-dimensional perspective regarding ideas and forms of expression. He uses a piece of land on the edge of the Cigondewah River for experiments on environmental art practices and social activation. Initially, residents or other residents used the land for garbage disposal. With his efforts, Tisna Sanjaya bought the land, slowly cleaned it, built a simple house, and planted various barrier trees. Not stopping there, Tisna Sanjaya and several artists often use the dirty Cigondewah River to do art and perform art while carrying out a campaign to clean the river of garbage. The environment becomes shady. Residents were then involved not in disposing of garbage but in processing (sorting, selecting) waste. It did not stop there; it was developed for residents and early childhood education (*PAUD*) activities.

Tisna was triggered by three things about the situation in Cigondewah before it was made into an art project, namely: 1) Plastic waste, 2) The water condition of the Cigondewah river, and 3) Changes in the socio-cultural conditions of the local community (Sanjaya, 2014). Therefore, he started his activities by targeting three problems: processing plastic waste, cleaning the Cigondewah River, and activating spaces built as art-cultural activities involving the surrounding community. All activities use art-making practices: recycling plastics, performing art in the river, painting, and drawing with children and residents. In the same area, it is used as a space to work and display works of art (paintings and three-dimensional objects). Mothers and children of residents use it for health counselling activities, dialogue activities between residents, and playgrounds for children. The next step, in collaboration with technocrats from ITB, Tisna Sanjaya, in partnership with Prof. Ir. I Gede Wenten, PhD (from the Faculty of Industrial Technology, ITB), realised the idea of making a windmill driven by water power, which functions to distil river water until it has clean quality and can be drunk directly without cooking first. *IBU* Cigondewah is now a space that inspires many people, or Tisna calls it the Cegondewah Cultural Center.

4.3 Yogyakarta Cultural Festival (Festival Kesenian Yogyakarta-FKY)

This is an example of how cultural events in the form of festivals are part of the solution to the cultural crisis. The cultural values in question are all activities of individuals, community members, and communities, in various forms of skills, traditional ceremonies, cooperation, culinary, and others, as part of maintaining the continuity of their lives and the actualisation of themselves or their communities. The Yogyakarta Cultural Festival was initially called the Yogyakarta Arts Festival. This name change was made by the Decree of the Governor of Yogyakarta (2019), and FKY is an annual event. Since 2023, FKY has been held to process sequential themes, namely "Food Sovereignty", and in 2024, to process the theme "Objects".

The theme of FKY was formulated by the Board of Curators based on the visions and missions of the Governor of Yogyakarta as a direction and guideline for development in Yogyakarta. The name change implies that culture gains its meaning broadly, covering a variety of work practices and skills related to people's lives, for example, qualified skills of iron pande craftsmen (makers of household and agricultural tools), weaving skills, carpentry skills, agricultural cultivation skills; Master Keris, Tembang Expert (Macapat), Culinary Expert, and others, who are classified as cultural actors. FKY is a space to celebrate the achievements of every individual, community, group, or society within the framework of artistic work. The participants and the community learn together to understand the meaning of culture and its practices in daily life.

5.0 Discussion

Art and activism are ideological. From the beginning, through in-depth observation and research, artists determine the direction of their artistic work, namely partiality, defence, and movement. Artists will be in the middle of problems, in the midst of society, and together, they will have conversations, dialogues, and 'work'. Of course, flexibly, artists feel part of themselves (participants; society), even though artists are in a position as initiators, directors, and leaders. This kind of work method can be called participatory as well as emancipatory.

The risk that must be realised immediately in choosing this method is anonymity, that is, the melting of individuals in a group or community. A person cannot necessarily claim that a work, art project, or art event is his work. But it is a joint work. Similarly, according to the emancipatory principle, art aims to empower and liberate human beings from limitations (perhaps also constraints to speak, express opinions, and get out of social, economic, political, and other pressures). The participatory and emancipatory approach has the opportunity to have a driving force (whoever is involved) to become more transparent about the purpose and function of the art project.

Artists who choose "activism" in their artistic thought and practice are conscious of connecting (intersecting) with critical socio-society, politics, environment, and cultural issues. In addition, the development process resulted in changes in spatial layout, including political, social-community, economic, environmental, and cultural spaces. Therefore, the practice of art activism has the opportunity to be contrary to the country's political policy. The political space is experiencing dynamics that are often too violent.

Art education institutions should come out and abandon normative and outdated ideas, let alone be insensitive to the reality of the crisis around them. Art education institutions should focus on social, environmental, and cultural crises to foster critical awareness of everyday existence. How? Of course, not only through conversations and appeals. But starting with the most essential thing, namely seeing and evaluating the curriculum, correcting, and voicing to the community. Immediately formulate courses that are relevant to

critical issues, for example, courses on art-design religiosity, art-design and society, art-design and local wisdom, craftsmanship and vernacular design, art-design and environmental conservation-restoration, and others of the kind, cognate or cross-clump.

Art education institutions no longer need to provide a significant portion to study the world's art and design issues. It is necessary to expand and intensify building an international network to see the development of thought and the creation of fine arts and design, which is pursued through research cooperation. Knowledge can be gained by studying textbooks about them. They are urging more frequent adaptive collaborations based on innovation (Tobing, 2024). Art education institutions need to look at the community's wisdom, skills, and values. The village is essential to be the focus of attention because of independence in all aspects, such as growing, living, and developing in the town. In the end, students in the fields of fine arts, crafts, and design are trained to have the ability to be problem solvers, not someone who is entangled in a complicator (an obstacle to problem-solving) (Tobing, 2024).

The art practice (a collaboration between farmers, photography, and design) that Anang Saptoto works on shows an attitude of partiality, defence, and movement. Farmers who experienced an economic crisis caused by the COVID-19 pandemic found a way out of Anang Saptoto's active role. More than just finding a way out, Anang Saptoto has succeeded in creating joy for farmers and consumers through photos composed into photo-based and design-based artworks.

Tisna Sanjaya's art practice through the Cegondewah Cultural Imah (IBU) institution is in the same spirit: moving and transforming the waste disposal area into a waste processing area and a centre for residents' activities. Tisna also expanded cooperation with technocrats to create (engineer) a water distillation wheel from the Cegondewah River. His efforts are to produce clean water ready to be consumed by the surrounding community. Tisna calls the water treatment/distillation project the Urine Art project.

The Yogyakarta Cultural Festival (FKY) is a "new awareness" of the Yogyakarta provincial government that expands the meaning/understanding of culture beyond just conversations related to art. The "new awareness" was initiated by the Governor of Yogyakarta, Sri Sultan Hamengku Buwono X, by encouraging the change of the institution of the Arts Council to the Cultural Council. This institution is a group of experts who function/are tasked with providing input and consideration of cultural development, whether requested or not. Next, the Governor of Yogyakarta encouraged the change of the Yogyakarta Arts Festival, which held an art festival event, to the Yogyakarta Cultural Festival. This name change indicates the expansion of the festival's agenda to provide a place for "cultural actors" in the public space.

6.0 Conclusion and Recommendations

Art and design practices within the framework of activism can be both answers and solutions to various crises (in the context of this conversation, social, environmental, and cultural crises). This art practice is within the framework of participatory and emancipatory activities.

Social, environmental, and cultural crises are urgent for anyone to respond to. Fine arts artists, artisans, and designers are present as pioneers in doing artwork collaboratively and become part of the solution (*problem solver*).

Art education institutions should reorient through critical evaluation of the curriculum, adding or replacing it with various courses that can trigger students' crucial awareness as part of the solution to the crisis.

Acknowledgement

We wish to extend our gratitude to ISI Yogyakarta and the Faculty of Visual Arts and Design for their resources and support, which enabled the completion of this research.

Paper Contribution to Related Field of Study

This contribution encourages artists and art education, along with works of art, crafts, and design through the aesthetic, artistic, and esoteric areas, to participate and build networks to carry out adaptive-innovative collaboration in social, environmental, and cultural crisis solutions.

.

References

Aspinall, EdwardBdrup, T (2012). Relational Aesthetics as a New Approach for Designing Spatial Aesthetic Expressions in Participatory Design, in Israsena, P. Tangsantikul, J. and Durling, D (eds), *Research: Uncertainty Contradiction Value-DRS International Conference* (2012, 1-4 July, Bangkok, Thailand). https://dl.designresearchsociety.org/drs-conference-papers/drs2012/researchpapers/33.

Dewi, Saras (2022). *Sembahyang Bhuvana – Renungan Filosofis tentang Tubuh, Seni, dan Lingkungan*, Yogyakarta: Pojok Cerpen dan Tanda Baca.

Hyphen – (Mufida, Ratna; Pitra Hutomo; Grace Samboh; Rachel K. Surijata; Penyunting) (2023). *Masakan Sepanjang Zaman: Bunga Rampai Seni Rupa Baru 1975-1989*, Depok: Komunitas Bambu.

Kent, Elly (2024). *Seniman dan Masyarakat: Ideologi-Ideologi Seni Rupa di Indonesia*, Jakarta: Gang Kabel.

Moelyono (1997). *Seni Rupa Penyadaran*, Yogyakarta: Yayasan Bentang Budaya.

Sanjaya, Tisna (2014). "Imah Budaya (IBU) Cegondewah – Revitalisasi Budaya dan Pemberdayaan Masyarakat Melalui Karya Seni Lingkungan" dalam *Extension Course Filsafat (ECF)* Universitas Parahiyangan, Bandung,

Tobing, Elwin, "Transformasi Pemerintahan, Agenda Presiden Orabowo" dalam *Kompas*, Rabu, 23 September 2024.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Artistic Hybridity and Local Environmental Awareness: Modern ink painting by Nanyang pioneer artists

Cui Yi, Sarena Abdullah*
**Corresponding Author*

School of The Arts,
Universiti Sains Malaysia, Penang, Malaysia

cuiyi1128@gmail.com, sarena.abdullah@usm.my
Tel: +8615937175501

Abstract
This paper examines the modern ink painting of the Nanyang pioneer artists, focusing on artistic hybridity and local environmental awareness, which blends traditional Chinese ink art with Western modern art in a Southeast Asian context. Using Homi K. Bhabha's theory of hybridity and the Third Space, the study applies visual and contextual analysis within the New Art History and Cultural Studies framework, critically exploring artistic innovation through cultural integration. The findings highlight Nanyang pioneer artists' contributions to modern ink painting, emphasizing cultural exchange, localization, and their significant global impact on Southeast Asian art.

Keywords: modern ink painting; Nanyang pioneer artists; hybridity; localization

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6147

1.0 Introduction

The Nanyang Pioneer Artists were Chinese émigré artists who settled in Malaya (modern-day Malaysia) and Singapore during the early to mid-20th century (Low, 2015). They were well-versed in both Western and Chinese artistic styles, techniques, and approaches, and created a distinct artistic movement that reflected their multicultural experiences (Sabapathy, 1979). This paper highlights the modern ink artworks and contributions of key Nanyang artists, including Chen Chong Swee (1910-1985), Chen Wen Hsi (1906-1991), and Cheong Soo Pieng (1917-1983). They saw no strong contradiction between Western and Chinese art, preferring to integrate both, demonstrating their hallmark openness to new expressions and diverse art traditions (Piyadasa, 1979). For instance, artists like Chen Chong Swee incorporated Western fixed-point perspective and the use of shadows in ink artworks, which are traits not usually found in traditional Chinese ink paintings. Others like Chen Wen Hsi used their understanding of Western modern styles like Cubism and Abstraction to create unconventional compositions for their ink paintings (Low, 2020). Cheong Soo Pieng's career was marked by a harmonious blend of abstract and realistic elements, evolving into ink sketches with agile, spontaneous brushwork that paid tribute to modern ink art.

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6147

This paper critically examines their adaptation of traditional Chinese aesthetic principles while integrating elements of modern Western art. Applying Homi K. Bhabha's concept of hybridity and the third space to analyze how these artists created new forms and meanings through cultural integration, this study explores the hybrid nature of their modern ink art and their engagement with local themes. This study will highlight the Nanyang Pioneer Artists' unique blend of cultural influences, innovative techniques, and engagement with their environment. The aim is to provide a deeper understanding of the unique contributions of Nanyang Pioneer Artists, which went beyond the Nanyang style and contributed to the global evolution of ink medium art.

2.0 Literature Review

In Singapore's art historical discourse, "Nanyang style" and "Nanyang art" are frequently mentioned. Art historians Redza Piyadasa and T.K. Sabapathy first attempted to define these terms during a seminal exhibition of Nanyang artists' works. Piyadasa (1979) described Nanyang art as an extension of developments in China, highlighting a shift towards Western-style art and aesthetics.

He noted that the first-generation Nanyang artists (the Nanyang pioneer artists) introduced sophistication and cosmopolitanism to British Malaya's local art scene, which had previously lacked these qualities. Although Sabapathy notes that the Nanyang pioneer artists training in both Western and Chinese art led them to adopt an experimental approach, blending "styles and techniques derived from two sources: Chinese pictorial traditions and the School of Paris," (Sabapathy, 1979). This synthesis of artistic techniques was not confined to a single medium. Nanyang artists produced works in both ink and oil. Notably, the use of the ink medium carried a strong cultural identity as Chinese. .

Chinese ink painting, or "guohua" (国画), is deeply rooted in cultural symbolism and integrates poetry and calligraphy (Long, 1984). One of the most expressive ink paintings, known as "xieyi"(写意), emphasizes the expressive qualities of ink and the artist's mastery of minimalist ink and fluid brushwork, it conveys personal interpretation and emotional response. According to Aida Yuen Wong, the brush-and-ink technique (bimo,笔墨) is paramount, reflecting the cultural and philosophical values of Chinese society (Wong, 2000). In the early 20th century, Chinese ink painting underwent significant transformations, driven by a confluence of cultural, political, and artistic changes with modernization and openness to Western influences (Du, 2014) Western modern art movements such as Impressionism, Expressionism, Cubism, and Surrealism were gaining global traction during this period. These movements emphasized abstract forms, bold compositions, and innovative uses of color and perspective, which contrasted with the traditional Chinese aesthetic (Vigneron, 2017). The changes in studying modern art movements and incorporating new techniques into their work were not limited to mainland China but also extended to Chinese communities overseas, notably Chinese immigrant artists in Southeast Asia. This region, particularly Singapore and Malaysia, became a melting pot of cultural exchanges due to its strategic location and colonial history.

Current research on the Nanyang Pioneer Artists has provided valuable insights of their modern art. For example, Ong Zhen Min emphasized their dual cultural identity, reflecting their Chinese heritage and modern sensibilities (Ong, 2015). Emilia Ong Ian Li and Izmer Ahmad examined the paintings of Nanyang artists from the 1950s and 1960s in Malaya/Malaysia, highlighting how their hybridity merged Chinese and Western traditions and addressed cultural identity and belonging (Li & Ahmad, 2015). Another study by Ong emphasized the deep roots of hybridity and diaspora in post-war Nanyang art, reflecting cultural identities and social realities (Li, 2015). Yvonne Low (2012) noted émigré artists' innovation of Western modernism with local themes in Singapore, while Low Sze Wee (2020)observed the incorporation of Cubism and Abstract Expressionism into Nanyang ink practices. Piyadasa identifies 1938 to 1965 as the golden period of the Nanyang art movement, while Ong points out that Nanyang art reached its maturity in the 1950s to 1960s (Low, 2022).

However, there are gaps in understanding their modern ink paintings, specifically after the golden period of the Nanyang style in the 1970s-1990s. The golden period was identified by Piyadasa from 1938 to 1965 of the Nanyang art movement, while Ong points out that Nanyang art reached its maturity in the 1950s to 1960s (Low, 2022). This persistence demonstrates that the modern ink artworks of the Nanyang pioneer artists went beyond the temporal confines of the Nanyang style, highlighting a research gap in understanding their continued influence and innovation in the ink medium beyond this period. However, as part of the globalized art scene, the ink medium remains the most authentic and original form for these artists. Therefore, an in-depth analysis is needed to explore these aspects and understand their significance in the broader context of modern ink painting. By addressing these gaps in current research, this study aims to provide a deeper understanding of the unique contributions of Nanyang artists to modern ink painting. It emphasizes the importance of cultural hybridity and environmental awareness in their works, this focus will shed light on how these artists transcended the traditional boundaries of the Nanyang style and continued to innovate within the ink medium.

3.0 Methodology

This study investigates Nanyang pioneer artists' innovative techniques in modern ink painting, their depiction of Southeast Asian environments and social contexts, and their contributions to the global art movement. It also seeks to examine the Nanyang Pioneer Artists' blend of traditional Chinese ink techniques with modern Western art, exploring their underlying motivations and processes of cultural integration through Homi K. Bhabha's concepts of hybridity and the Third Space. By addressing these aspects, this study aims to provide a comprehensive understanding of Nanyang pioneer artists' impact on modern ink painting, which went beyond the Nanyang style and contributed to the global evolution of ink medium art.

To achieve these objectives, the qualitative research design is employed, combining visual and contextual analysis within New Art History and Cultural Studies frameworks. By examining the composition, brushwork, color use, and subject matter in representative works by Chen Chong Swee, Chen Wen Hsi, and Cheong Soo Pieng, the study reveals the hybridity of artistic approaches and local awareness. Homi K. Bhabha's hybridity theory offers insights into cultural integration in Southeast Asia, highlighting the diversity in their techniques, themes, and materials. Academic sources and archival collections from institutions like the Singapore National Art Gallery support the research. While this study relies on qualitative visual and contextual analysis, future research could benefit from incorporating quantitative methods, such as surveys or interviews with contemporary artists and art historians, to gather diverse perspectives on the lasting impact of Nanyang pioneer artists.

Despite the comprehensive approach, the study faces certain limitations. First, its focus on specific Nanyang pioneer artists may limit broader generalizations about the wider Southeast Asian art movement. Second, the qualitative nature of the research, reliant on visual and contextual analysis, introduces an element of subjectivity, which may affect the reproducibility of findings. To deepen the theoretical foundation, future research could incorporate additional frameworks, such as postcolonial theory or global art history perspectives, to further examine the cross-cultural dynamics and global influence of the Nanyang pioneer artists. Additionally, the availability of archival materials and artwork collections may pose limitations, as access to certain works and historical records may be restricted or incomplete, potentially impacting the depth of analysis.

4.0 Findings and Discussion

4.1 Artistic Hybridity in the Ink Art Works of Nanyang Pioneer Artists

Based on the shared educational background in China, Nanyang pioneer artists saw no contradiction between Western and Chinese art, preferring to integrate both. Each artist found ways to achieve this synthesis, as there were no prescribed methods. The distinctive artistic hybridity approach highlights the adaptation of ink painting as the pictural language with traditional Chinese aesthetics but also represents a fusion of Western art with local awareness of Southeast Asia. It is marking a significant departure from traditional Chinese ink art styles, serving as a testament to the pioneering spirit of the Nanyang pioneer artists.

Chen Chong Swee's "Kampong Scene" (1937), was an early example of this hybrid approach, where detailed brush techniques and realistic depiction of Malay village life are combined. A common scene, coconut trees in Singapore are not found in abundance anymore. Despite their prevalence in the past — dotting the coastline and a regular sight in the kampongs (villages) — they were seldom included in local Chinese ink art. Similarly, traditional Chinese landscape paintings typically employ a moving multiple-point perspective (Low, 2020). Nanyang artists like Chen Chong Swee occasionally used a single fixed-point perspective, more common in Western art. The late artist's work is on display at the National Gallery Singapore as part of a collection of 200 works by prominent 20th-century artists who used Chinese ink as their medium of expression, alongside "Strokes of Life: The Art of Chen Chong Swee" (Singapore National Art Gallery, n.d.). For instance, Chen Chong Swee, in his essay "Zhongxihua zatan" (《中西画杂谈》1948, A Discussion of Chinese and Western Paintings), argued that Western art, before the rise of Impressionism, was not concerned with lines. He noted that artists like Cézanne, Matisse, Van Gogh, and Gauguin began using linework in their paintings to convey emotional power and energetic rhythm, a practice influenced by Chinese art (Low, 2020).

Similarly, Chen Wen Hsi's "Herons" (1991) incorporates Cubist elements, showcasing his self-taught methods of integrating Western modern art movements such as Cubism and Abstract Expressionism into his ink practice. For instance, Chen Wen Hsi drew inspiration from the fragmented forms of Cubism to create interlocking mosaics of colored planes for his semi-abstract painting of herons. Likewise, these modernist influences allowed the artists to explore new dimensions of expression and abstraction, blending traditional techniques with contemporary art forms. By employing innovative techniques like interlocking mosaics of colored planes and grid-like patterns, he created a harmonious fusion approach that exemplifies the dynamic interplay between cultural heritage and contemporary expression, demonstrating the potential for artists to innovate within a globalized art world.

In some of his early semi-abstract landscape paintings during the 1950s, Cheong Soo Pieng used overlapping color facets, grid-like patterns, and amorphous shapes to suggest kelongs—traditional wooden houses built on stilts over the sea—casting reflections on the watery surface. Cheong Soo Pieng's artistic vision was profoundly influenced by his travels to Europe in 1965-1967, where he encountered the abstract movement, a transformative journey to Europe catalyzed Cheong's artistic evolution, steering him towards an abstract and lyrical series deeply inspired by the natural world. Though not a conventional ink painter, Cheong's "ink-based" works are integral to regional modernism and Nanyang art. His career was marked by a harmonious blend of abstract and realistic elements, evolving into ink sketches with agile, spontaneous brushwork that paid tribute to traditional Chinese ink art. In his later years, Cheong's eclectic approach to modernity transcended traditional doctrines and the East-West dichotomy, redefining the boundaries of "Chinese painting" with his contemporary interpretations of the "ink aesthetic," demonstrating a unique form of artistic hybridity shaped by his innovative vision. This unique synthesis, initially identified as the Nanyang style during a certain period, has beyond the Nanyang style under the influence of globalization. The pioneer artists' innovation is not only evident in their ink-medium artworks but has also become a part of the worldwide art trends.

This paper argues that the hybridity art approach is evident in their adoption and adaptation of elements from both cultures, embodies a distinct artistic identity that transcends traditional boundaries, a negotiation between Chinese heritage and Western modernism. Homi K. Bhabha's conceptualization is relevant in conceptualizing immigrants' cultural identities in the diaspora, including the immigrant artists as the diaspora as well. Bhabha's concept of hybridity and the third space can be seen in the modern ink artworks of the Nanyang

pioneer artists, as they navigate and integrate multiple cultural identities to create a new artistic language. Hybridity refers to the creation of new cultural forms and identities arising from the interaction of different cultural influences. Bhabha acknowledges the plurality of voices and subjectivities in hybrid space. "In fact, he asserts that culture does not exist in isolation, but rather interact and overlap within a hybrid space. (Bhabha, 1994) ", it describes the interaction and blending of multiple cultures, generating new meanings and identities and moving beyond simple dichotomies like self/other or East/West.

The third space is an in-between space where these cultural identities and meanings are negotiated and transformed (Bhandari, 2020) It reflects Homi K. Bhabha's concepts of cultural hybridity and the Third Space, "It creates a sense of the new as a revolutionary act of cultural translation." (Bhabha, 1994) The Nanyang Pioneer Artists operated within the multicultural and dynamic environment of Southeast Asia, a region shaped by historical migration, colonialism, and cultural exchanges. Their modern ink paintings, with their cross-regional appeal, serve as a visual testament to this historical transformation. This hybridity approach is evident in the “Third Space”, the artists adopted and adapted elements from both China and Southeast Asia, creating works that are neither purely Chinese nor entirely Western but a harmonious blend of Southeast Asia. It can also supported by Emilia Ong Ian Li: “The notion of hybridity is employed here to examine their formalistic explorations, which may be viewed as expressions of a diasporic community." (Li, 2015)

4.2 Local Awareness in the Artworks of Nanyang Pioneer Artists

Sabapathy (1979) also observed that Nanyang artists aimed to depict the local environment and people, approaching the concept of “local” fluidly and incorporating motifs from their surroundings to meet pictorial needs. Nanyang Pioneer Artists departed from these traditional themes to depict local Southeast Asian environments and experiences. They incorporated elements unique to their new surroundings, such as tropical landscapes, local flora and fauna, and scenes of local village life. This shift reflected a broader cultural exchange and adaptation, blending traditional Chinese techniques with local subjects to create a new, innovative visual language (Abdullah, 2010).

Traditional Chinese landscape painting is characterized by a multiple-point perspective that captures expansive scenes, adhering to principles of balance and harmony. Artists employ techniques of texture strokes to create the texture of rocks and mountains and leave white space to suggest mist or water, enhancing the ethereal quality of the landscape. However, Nanyang Pioneer Artists diverged from these conventions, opting to depict the local Southeast Asian environments and experiences. They infused their works with tropical landscapes, local flora and fauna, and village life scenes, reflecting a cultural exchange and adaptation. By blending traditional Chinese techniques with these local subjects, they crafted a new, innovative visual language that captured the essence of their tropical environment and local life, showcasing their adeptness at merging cultural heritage with contemporary art influences.

Similarly, Chen Wen Hsi incorporated local fauna into his works, as seen in "Herons," where he abstractly portrays herons, reflecting his engagement with local wildlife and the influence of Cubism. His use of fragmented forms and interlocking mosaics of colored planes demonstrates his innovative approach to integrating local subjects. Cheong Soo Pieng also focused on local life, depicting everyday scenes and local figures with a semi-abstract style. His semi-abstract landscapes skillfully merge local scenery with abstract techniques, showcasing traditional wooden houses on stilts through overlapping color facets and grid-like patterns. This innovative portrayal of Southeast Asian settings highlights the artists' ability to harmoniously blend their cultural heritage with contemporary art influences, creating a distinctive visual language that resonates with their multicultural environment.

The environmental themes in the Nanyang artists' works reflect their adaptation to and appreciation of their new surroundings. By incorporating local elements into their paintings, they not only document environmental consciousness but to underscore their ability to merge cultural traditions with contemporary experiences. This approach aligns with Bhabha’s idea of the third space, where new cultural meanings and identities are created through the intersection of different influences. Bhabha's view on the creation of new cultural meanings in the Third Space: "It creates a sense of the new as a revolutionary act of cultural translation." (Bhabha, 1994)

Despite their innovative contributions, the Nanyang Pioneer Artists faced criticisms for their hybrid style. Some critics argued that their work diluted traditional Chinese art, while others felt it was overly influenced by Western modernism (Kee, 2011). The challenges faced by the Nanyang Pioneer Artists highlight the complexities of cultural hybridity and the difficulties of navigating multiple cultural identities. Additionally, the political climate of Southeast Asia during their time posed challenges to their artistic expression. The skepticism towards their hybrid style reflects broader tensions between tradition and modernity, as well as the challenges of cultural integration in a rapidly changing socio-political context. It can be explained by the discussion of the fluidity of cultural identities in the Third Space "The third space is something like the idea of deferral in Post-structuralism... Thus, a culture’s difference is never simple and static but ambivalent, changing, and always open to further possible interpretation." (Bhabha, 1994) These difficulties, however, also underscore the resilience and adaptability of the Nanyang artists, who continued to innovate and push the boundaries of artistic expression despite these obstacles.

5.0 Conclusion and Recommendations

The study of the Nanyang Pioneer Artists' innovative use of artistic hybridity in modern ink painting illustrates how they went beyond the Nanyang style. Artists like Chen Chong Swee, Chen Wen Hsi, and Cheong Soo Pieng synthesized traditional Chinese techniques with Western modernist elements and Southeast Asian themes. By incorporating Western techniques and perspectives, and embracing abstract elements influenced by New York Abstract Expressionism, they created a new visual language. By incorporating local subjects such as tropical landscapes, indigenous flora and fauna, and everyday village scenes, they further enriched their art. This made their work resonate deeply with their Southeast Asian context, reflecting the unique cultural and environmental characteristics of the region. Bhabha’s concepts of hybridity and the third space help to contextualize their works within the broader framework of cultural negotiation

and transformation, highlighting their contribution to the evolution of modern ink painting. Moreover, their work was not only influenced by global art trends but also became part of those trends, contributing significantly to the global art world. Their influence extended to the next generation of ink artists, encouraging ongoing exploration of modern ink art in Singapore and Malaysia, pushing the art form into new phases of development.

Acknowledgement

The researchers wish to thank Universiti Sains Malaysia for the Research University Grant (RUI) 1001/PSENI/8016093, which has been instrumental in enabling this research.

Paper Contribution to Related Field of Study

This study makes significant contributions to modern ink painting by highlighting the artistic hybridity and environmental awareness of the Nanyang Pioneer Artists. By examining how these artists blended traditional Chinese ink techniques with Western art and Southeast Asian themes, the research provides a deeper understanding of their innovative practices. It also extends the discourse on cultural hybridity and the Third Space, as articulated by Homi K. Bhabha, showcasing how these artists transcended traditional boundaries and influenced the global art movement. This study underscores the Nanyang Pioneer Artists' role in evolving modern ink painting and their impact on subsequent generations, particularly in Singapore and Malaysia.

References

Abdullah, S. (2010). Absenteeism of Malaysian Identity In Art In The Early Years of Independence. *Journal of Southeast Asian Studies*, *15*(1), 133–150.

Barrett, T. C. (2012). The Chinese Diaspora in South-East Asia. *The Chinese Diaspora in South-East Asia*, *July 2015*. https://doi.org/10.5040/9780755619313

Bhabha, H. K. (1994). *The location of culture*. Routledge.

Bhandari, N. (2020). Negotiating Cultural Identities in Diaspora: A Conceptual Review of Third Space. *Curriculum Development Journal*, *42*, 78–89. https://doi.org/10.3126/cdj.v0i42.33215

Du, W. (2014). A turning point for guohua?: Xu Beihong and transformative encounters with the socialist spirit, 1933-1953. *Twentieth-Century China*, *39*(3), 216–244. https://doi.org/10.1179/1521538514Z.00000000046

Elkins, J. (2013). *A New Definition of Contemporary Chinese Ink Painting*. 1–20. https://www.academia.edu/3344609/A_New_Definition_of_Chinese_Ink_Painting

Kee, J., (2011). *Introduction Contemporary Southeast Asian Art Introduction Contemporary Southeast Asian Art The Right Kind of Trouble*. *8822*. https://doi.org/10.1080/09528822.2011.587681

Li, E. O. I. (2015). Hybridity as Expressions of a Diasporic Community: Selected Nanyang Artists. *Malaysian Journal of Performing and Visual Arts*, *no. 1*(2015), 52–70.

Li, E. O. I., & Ahmad, I. (2015). Expressions of hybridity as strategy for malayan nationalism: Selected artworks in modern malayan art. *Wacana Seni*, *14*, 1–30.

Long, J. (1984). *Chinese Ink Painting: Techniques in Shades of Black* (p. 91). http://www.amazon.de/dp/0713714905

Low, S. W. (2020). Chinese Artists in Nanyang – An Aspect of Modernity in Singapore Art. *Chinese Culture Quarterly 九州学林, Volume 35, 2015 by City University of Hong Kong*, *Volume 35,* 1–18.

Low, S. W. (2022). What is Nanyang art? *ThinkChina*. https://www.thinkchina.sg/what-nanyang-art

Low, Y. (2015). Becoming professional artists in postwar Singapore and Malaya: Developments in art during a time of political transition. *Journal of Southeast Asian Studies*, *46*(3), 463–484. https://doi.org/10.1017/S002246341500034X

Ong, Z. M. (2015). Nanyang reverie. In L. S. Wee (Ed.), *Siapa Nama Kamu? Art in Singapore Since the 19th Century* (pp. 42-53). National Gallery Singapore.

Singapore National Art Gallery. (n.d.). *Strokes of life: The art of Chen Chong Swee*. Retrieved July 26, 2024, from https://www.nationalgallery.sg/see-do/programme-detail/455/strokes-of-life-the-art-of-chen-chong-swee

Vigneron, F. (2017). 'Ink Art' as strategy for Hong Kong institutions. *Journal for Cultural Research*, *21*(1), 92–117. https://doi.org/10.1080/14797585.2017.1281473

Wong, A.-Y. (2000). A New Life for Literati Painting in the Early Twentieth Century: Eastern Art and Modernity, a Transcultural Narrative? *Artibus Asiae*, *60*(2), 297. https://doi.org/10.2307/3249921

Wong, A. Y. (2019). Ink painting in the sinophone world: Liu kuo-sung's Hong Kong period. *Art in Translation*, *11*(1), 22–44. https://doi.org/10.1080/17561310.2019.1582929

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta
https://arcadesa.isi.ac.id/index.html
8th Art, Craft and Design in Southeast Asia International Symposium
ISI Yogyakarta Indonesia, 27-28 September 2024
Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Exploring the Integration of Artificial Intelligence in Co-Design Framework for Designer

Muhammad Zaffwan Idris[1]*, Mohd Ekram Alhafis Hashim[1], Nursafinas Albakry[1], Nandang Septian[2]
**Corresponding Author*

[1] Department of Creative Multimedia, Sultan Idris Educational University, Tanjong Malim, Malaysia,
[2] Industrial Design Program, Institut Seni Indonesia Yogyakarta, Yogyakarta, Indonesia

zaffwan@fskik.upsi.edu.my, ekram@fskik.edu.my, nursafinas@fskik.upsi.edu.my, nandangseptian@isi.ac.id
Tel: +6019-6673077

Abstract
This study explores the integration of AI into the co-design process, emphasizing how AI can enhance collaboration between designers and stakeholders. Key areas include autonomous navigation, intelligent systems, and trajectory optimization, which can boost creativity, streamline workflows, and improve decision-making. A literature review of 20 papers reveals that AI can act as a collaborative agent, automating routine tasks, providing real-time feedback, and fostering creative exploration. However, challenges remain in maintaining human-centered design values and preserving designers' agency. Future research should develop AI tools that support co-design dynamics and address ethical concerns in creative fields.

Keywords: Artificial Intelligence (AI); design; co-design

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6348

1.0 Introduction

The rapid development of artificial intelligence (AI) has altered several industries, including design, where it is rapidly being integrated into collaborative frameworks such as co-creation. Co-design, which incorporates the active engagement of designers and stakeholders in the creative process, has traditionally been based on human intuition, creativity, and communication skills (Guo, 2023a). However, advancing AI technologies, particularly in sectors such as autonomous navigation, intelligent systems, and trajectory optimization, opens up new chances to improve and change these collaborative efforts.

AI's position in design has evolved from a tool for efficiency to a collaborator in creativity (German et al., 2019). Autonomous navigation, for example, enables designers to explore large design environments that would otherwise be too difficult or time-consuming to research manually. Intelligent systems, with their ability to analyze vast datasets and deliver real-time insights, can help designers make more informed decisions, eliminating the trial-and-error method that is commonly associated with creative processes (Edmonds,

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6348

2020; German et al., 2019; Tedre et al., 2023). Meanwhile, trajectory optimization provides new approaches for optimizing processes, guaranteeing that design activities are accomplished more precisely and efficiently.

Despite these advances, the use of AI in co-design is still underexplored, notably how AI might assist designers without weakening their creative independence(Hao et al., 2021; Malik et al., 2022). This research addresses this gap by conducting a comprehensive literature review on integrating AI inside co-design frameworks. This study will analyze 20 papers, fifteen from the Scopus database and five from Research Rabbit, to address the fundamental research question: "How is AI integrated into the co-design process for designers?"

This study's findings will help deepen our understanding of AI's potential in co-design and provide insights into how designers might use AI to improve creativity, collaboration, and efficiency while keeping the human-centered character of the design process.

2.0 Literature Review

The design landscape is rapidly evolving with Artificial Intelligence (AI) integration, offering both transformative potential and significant challenges. Co-design, or participatory design, involves stakeholders throughout the design process to create solutions tailored to users' needs (Hussaini et al., 2024; Zhang et al., 2024). AI's role in enhancing co-design frameworks is a growing area of research, providing improved collaboration, feedback mechanisms, and innovative solutions. However, challenges must be addressed to realize AI's potential in this space fully.

AI has transformed industries by automating tasks, improving decision-making, and offering new insights. In design, it has been applied to generative design, UX enhancement, and design validation (Poduval et al., 2024; Yu et al., 2022), enabling designers to explore a broader range of possibilities (D. Chen et al., 2024; Seng & Ang, 2022). AI's data analysis capabilities make it an invaluable tool in co-design and enhancing stakeholder engagement. Additionally, predictive analytics helps forecast user preferences and guide design decisions (Hussaini et al., 2024; Largo & Pino, 2024).

Fig. 1. A gallery mock-up view of the Cangjie's Poetry art installation.
(left) The first projection: Live streaming imagery writes new symbols.
(right) The second projection: Intelligent visual poetry describes surroundings.
(Source: Zhang et al., 2024)

Co-design emphasizes stakeholder collaboration, fostering a dynamic and iterative process. AI integration can enhance these efforts in several ways, enabling real-time collaboration where stakeholders interact with design concepts and provide instant feedback (German et al., 2019; Hao et al., 2021). Tools like Autodesk's Generative Design allow users to input preferences and explore multiple design options, promoting inclusivity and more effective participation (Du et al., 2022; Seng & Ang, 2022).

AI also enhances feedback systems by analyzing stakeholder data to identify patterns and emerging concerns. Natural language processing (NLP) tools can assess qualitative feedback, helping designers respond more effectively to stakeholder needs (D. Chen et al., 2024; Poduval et al., 2024). AI's ability to generate multiple design options supports the co-design's goal of exploring diverse perspectives (Bui & Alaei, 2022; Zhang et al., 2024).

However, challenges arise. Over-reliance on AI might diminish the human empathy central to co-design, while privacy and algorithmic bias issues must be addressed (Guo, 2023a; Tedre et al., 2023). Designers must also adapt to AI tools, requiring new skills and careful integration into established workflows (Malik et al., 2022).

Future research should explore how AI can enhance stakeholder interaction, balance human-centric co-design principles, and create adaptable design systems that respond to real-time feedback (D. Chen et al., 2024; González-Vélez et al., 2021). As AI evolves, addressing ethical concerns while preserving human creativity and collaboration will be crucial to its successful integration in co-design frameworks (Bui & Alaei, 2022; Guo, 2023a).

3.0 Methodology

In accomplishing a complete literature review survey, 76 documents were first discovered from Scopus and 10 from Research Rabbit, with a focus on publications published between 2020 and 2024 in the journal category. Using the search string TITLE-ABS-KEY ("Artificial Intelligence" AND " Arts" (art OR co-design)), the initial pool was reduced to 71 relevant articles.

The selection was then further refined by a comprehensive screening procedure. Articles with irrelevant titles, as well as abstracts and content that was inconsistent with the study's topic, were eliminated. Finally, 20 publications were found appropriate for in-depth analysis.

The articles chosen through this rigorous screening process represent extensive literature within the defined timeframe and conditions. The methodological approach, built on the search string and subsequent screening criteria, guaranteed that only relevant studies were included in the final analysis.

Based on Scopus, a renowned database, this survey approach provides a solid framework for researching the incorporation of artificial intelligence ethics. The refined selection of 27 publications provides a complete picture of the present research landscape, allowing for a nuanced investigation of the junction of artificial intelligence and art within the era chosen.

4.0 Findings

4.1. Autonomous Navigation

Integrating artificial intelligence (AI) into co-design frameworks, especially regarding autonomous navigation, has made notable progress across various fields. AI's ability to enable autonomy and assist human decision-making is a recurring theme. This discussion compares AI's application in spacecraft navigation, microwave filter design, human fall detection, and interactive art, drawing insights for co-design.

Hao et al. (2021) present a vision-based guidance, navigation, and control (GNC) system for spacecraft, emphasizing AI's role in real-time decision-making. AI enables spacecraft to navigate autonomously in unpredictable environments, reducing reliance on human control using deep learning (DL) and probabilistic modeling. In contrast, Yu et al. (2022) explore AI-driven automation in microwave filter design, which uses data-driven optimization to handle complex, dynamic conditions. Though these fields differ, both demonstrate AI's capacity to automate tasks traditionally managed by human expertise.

Bui and Alaei (2022) further illustrate AI's role in optimization by utilizing virtual reality (VR) to generate training data for fall detection algorithms, enhancing AI performance in data-scarce environments. This parallels AI's use in autonomous navigation, optimizing complex systems. Zhang et al. (2021) explore AI in interactive art, where AI autonomously writes and interprets poetry, symbolizing AI's potential in co-design. AI can collaborate creatively with designers, offering new ideas through autonomous interpretations.

These studies show AI's transformative potential in enabling real-time, autonomous decision-making, from spacecraft navigation (Hao et al., 2021) to electromagnetic filter design (Yu et al., 2022). However, full AI autonomy remains a challenge. Hao et al. (2021) note that fully autonomous space systems are still years away, and Guo (2023a) highlights designers' concerns about AI's ambiguous role in creativity, which could complicate co-design processes.

In conclusion, AI's integration into co-design frameworks aligns with broader trends in enhancing autonomy and optimizing complex tasks. The future of AI in co-design lies in balancing human creativity with AI autonomy, making AI a co-creation partner rather than a replacement. Ongoing research will continue to shape how designers work with AI, fostering collaboration between human and machine creativity.

4.2. Intelligent Systems

Integrating Artificial Intelligence (AI) into co-design frameworks transforms design by enhancing decision-making, optimization, and efficiency. Research highlights how intelligent systems empower designers and engineers in complex domains, particularly in cloud and edge computing. This paper synthesizes key ideas from various studies to explore the implications of AI for co-design.

Seng and Ang (2022) discuss the growing complexity of AI installations in cloud and edge devices, where embedded intelligence (EI) supports automation in IoT and mobile applications. This approach emphasizes adaptability and scalability, especially in Industry 4.0 environments. Similarly, Du et al. (2022) examine the computational efficiency of AI in deep learning tasks using Deep Learning Processing Units (DLPUs), achieving a significant speed boost and energy savings, thus optimizing tasks requiring high computational power and real-time decisions.

Zhang et al. (2024) introduce ReCollection, an AI-powered art installation that fosters non-linear storytelling and community memory through visual inputs, emphasizing empathy and inclusivity in the design process. This contrasts with more technical applications by focusing on emotional and social engagement in co-creation.

The comparison of these studies underscores AI's adaptability across various applications. While Seng & Ang (2022) focus on real-time processing in edge devices, Du et al. (2022) highlight performance improvements in deep learning, and Zhang et al. (2024) explore AI's impact on creativity and communal connections in design.

Though these applications differ—from industrial to artistic frameworks—AI consistently emerges as an enabler of efficiency, creativity, and collaboration. However, the autonomy and flexibility of these systems vary, with Seng & Ang (2022) focusing on distributed, high-performance systems, while Zhang et al. (2024) explore AI's role in enhancing human-machine interactions.

AI's co-design success relies on its ability to support creativity, optimize workflows, and enable real-time decision-making. Seng & Ang's (2022) EI approach emphasizes real-time processing in constrained environments, but integrating these systems into established frameworks poses scalability challenges. Du et al. (2022) highlight the performance benefits of DLPUs, but their specialized nature may

limit their use in smaller teams. Meanwhile, Zhang et al. (2024) argue that AI can foster deeper emotional and community connections in the design process.

AI's incorporation into co-design offers significant potential for enhancing technical and creative aspects. From embedded intelligence to DLPUs, AI systems boost efficiency, decision-making, and creative collaboration. However, careful consideration is needed to balance scalability, platform constraints, and the human elements of design. As AI evolves, co-design frameworks must ensure designers retain agency while leveraging AI's transformative power.

4.3. Trajectory Optimization

Trajectory optimization, a key focus of artificial intelligence (AI), is crucial in enhancing the efficiency of physical, digital, and operational systems. Its applications span diverse fields such as engineering, communications, cybersecurity, and environmental research. This article synthesizes AI-based trajectory optimization across these sectors, emphasizing its impact on co-design frameworks.

In J. Chen et al. (2023), AI optimizes well trajectories for directional drilling by evaluating the entire geological profile through a new metric, the Formation Evaluation Score (FES). This method enhances hydrocarbon extraction while balancing engineering constraints, offering a more comprehensive approach to trajectory design in complex geological settings.

Poduval et al. (2024) focus on AI-driven trajectory optimization in 6G communication networks, specifically for IoT devices. Their solution improves data transmission reliability and reduces energy consumption, showcasing AI's potential to optimize pathways in highly connected, noisy environments, vital for future networks like 6G.

J. Chen et al. (2023) also explore AI in network security through Generative Adversarial Imitation Learning-based Penetration Testing (GAIL-PT). This framework automates attack path generation, making vulnerability testing faster and more efficient than manual methods, underscoring AI's utility in optimizing cybersecurity.

In ecology, González-Vélez et al. (2021) demonstrate AI's ability to predict wildlife-vehicle collision hotspots using AI algorithms, geographic information systems, and multispectral imaging. This application shows AI's effectiveness in spatial trajectory optimization for environmental and conservation efforts.

Across these sectors, AI enhances trajectory optimization by improving efficiency, reliability, and decision-making. From geological well trajectories and communication networks to cybersecurity and wildlife conservation, AI's capacity to streamline design processes is transformative. As AI continues to evolve, its role in co-design frameworks will lead to more advanced, efficient systems across industries.

5.0 Discussion

AI in co-design frameworks has significantly increased autonomous navigation, allowing systems to function autonomously in complex and dynamic situations. AI-driven decision-making has become critical in many applications, from satellite navigation to digital simulations, enabling more efficient and real-time job optimization. By automating operations that formerly required human intervention, AI enables systems to adapt and respond to unexpected events, improving overall functionality and reliability.

In addition to its role in navigation, AI is important in intelligent systems that optimize designs and make decisions. These technologies, incorporated in cloud and edge computing, enable real-time processing and scalability, giving designers the tools to improve productivity in both technical and creative activities. AI contributes to more effective design outcomes by employing dedicated hardware for deep learning and other computationally demanding processes while also significantly improving speed and energy consumption.

Trajectory optimization is another crucial area where AI shows its value in co-design frameworks. Whether optimizing physical paths in industries such as drilling and network security or forecasting environmental patterns in wildlife research, AI allows for more exact and effective route design. AI refines these processes by examining broader factors and situations, improving overall system efficiency across multiple applications. This capacity to optimize paths within complicated, interconnected systems demonstrates AI's transformational influence in design and issue solutions.

6.0 Conclusion and Recommendations

To summarize, using artificial intelligence in co-design frameworks transforms the landscape of design and optimization across multiple disciplines. AI's ability to navigate autonomously, make intelligent decisions, and optimize trajectory improves efficiency and enables real-time adaptability in difficult surroundings. By automating formerly manual procedures, AI enables designers and engineers to do complex jobs with increased precision and speed. As AI evolves, its function as a collaborative tool in co-design will allow for more sophisticated and creative solutions, ensuring a future in which human inventiveness and machine intelligence operate seamlessly together.

Acknowledgments

We gratefully acknowledge the researchers, databases, and collaborators whose contributions and insights were essential to this study.

Paper Contribution to Related Field of Study

This paper advances design research by highlighting how AI enhances co-design processes while addressing challenges in maintaining human-centered values and ethics.

References

Bui, V., & Alaei, A. (2022). Virtual reality in training artificial intelligence-based systems: a case study of fall detection. Multimedia Tools and Applications, 81(22), 32625–32642. https://doi.org/10.1007/s11042-022-13080-y

Chen, D., Mao, K., Ye, Z., Li, W., Yan, W., & Wang, H. (2024). An artificial intelligent well trajectory design method combing both geological and engineering objectives. Geoenergy Science and Engineering, 236. https://doi.org/10.1016/j.geoen.2024.212736

Chen, J., Hu, S., Zheng, H., Xing, C., & Zhang, G. (2023). GAIL-PT: An intelligent penetration testing framework with generative adversarial imitation learning. Computers and Security, 126. https://doi.org/10.1016/j.cose.2022.103055

Du, Z., Guo, Q., Zhao, Y., Zeng, X., Li, L., Cheng, L., Xu, Z., Sun, N., & Chen, Y. (2022). Breaking the Interaction Wall: A DLPU-Centric Deep Learning Computing System. IEEE Transactions on Computers, 71(1), 209–222. https://doi.org/10.1109/TC.2020.3044245

Edmonds, E. A. (2020). A journey from abstract film to concrete interaction. Digital Creativity, 31(3), 147–155. https://doi.org/10.1080/14626268.2020.1781195
German, K., German, K., Limm, M., Limm, M., Wölfel, M., Wölfel, M., Helmerdig, S., & Helmerdig, S. (2019). Co-designing Object Shapes with Artificial Intelligence. ArtsIT/DLI. https://doi.org/10.1007/978-3-030-53294-9_21

German, K., German, K., Limm, M., Limm, M., Wölfel, M., Wölfel, M., Wölfel, M., Helmerdig, S., & Helmerdig, S. (2019). Towards Artificial Intelligence Serving as an Inspiring Co-Creation Partner. EAI Endorsed Transactions on Creative Technologies. https://doi.org/10.4108/eai.26-4-2019.162609

González-Vélez, J. C., Torres-Madronero, M. C., Murillo-Escobar, J., & Jaramillo-Fayad, J. C. (2021). An artificial intelligent framework for prediction of wildlife vehicle collision hotspots based on geographic information systems and multispectral imagery. Ecological Informatics, 63. https://doi.org/10.1016/j.ecoinf.2021.101291

Guo, X. (2023a). Rethinking designer agency: A case study of co-creation between designers and AI. IASDR 2023: Life-Changing Design. https://doi.org/10.21606/iasdr.2023.478

Guo, X. (2023b). Rethinking designer agency: A case study of co-creation between designers and AI. IASDR 2023: Life-Changing Design. https://doi.org/10.21606/iasdr.2023.478

Hao, Z., Shyam, R. B. A., Rathinam, A., & Gao, Y. (2021). Intelligent Spacecraft Visual GNC Architecture With the State-Of-the-Art AI Components for On-Orbit Manipulation. Frontiers in Robotics and AI, 8. https://doi.org/10.3389/frobt.2021.639327

Hussaini, H., Yang, T., Bai, G., Urrutia-Ortiz, M., & Bozhko, S. (2024). Artificial Intelligence-Based Hierarchical Control Design for Current Sharing and Voltage Restoration in DC Microgrid of the More Electric Aircraft. IEEE Transactions on Transportation Electrification, 10(1), 566–582. https://doi.org/10.1109/TTE.2023.3289773

Largo, M., & Pino, F. (2024). Piña, Why is the Sky Blue? Crafting Cyber Transfeminist and Filipinx Futurisms through Creative Technologies. Asian Diasporic Visual Cultures and the Americas, 8(3), 285–306. https://doi.org/10.1163/23523085-08030002

Malik, H., Chaudhary, G., & Srivastava, S. (2022). Digital transformation through advances in artificial intelligence and machine learning. Journal of Intelligent and Fuzzy Systems, 42(2), 615–622. https://doi.org/10.3233/JIFS-189787

Poduval, P. P., Ni, Y., Zou, Z., Ni, K., & Imani, M. (2024). NetHD: Neurally Inspired Integration of Communication and Learning in Hyperspace. Advanced Intelligent Systems, 6(7). https://doi.org/10.1002/aisy.202300841

Seng, K. P., & Ang, L.-M. (2022). Embedded Intelligence: State-of-the-Art and Research Challenges. IEEE Access, 10, 59236–59258. https://doi.org/10.1109/ACCESS.2022.3175574

Tedre, M., Mäkitalo, K., Vartiainen, H., Kahila, J., Laru, J., & Iwata, M. (2023). Generation AI: Participatory Machine Learning Co-Design Projects with K-9 Students in Finland. Annual Conference on Innovation and Technology in Computer Science Education. https://doi.org/10.1145/3587103.3594171

Yu, Y., Zhang, Z., Cheng, Q. S., Liu, B., Wang, Y., Guo, C., & Ye, T. T. (2022). State-of-the-Art: AI-Assisted Surrogate Modeling and Optimization for Microwave Filters. IEEE Transactions on Microwave Theory and Techniques, 70(11), 4635–4651. https://doi.org/10.1109/TMTT.2022.3208898

Zhang, W., Cheng, L., & Luo, J. (2024). ReCollection: Creating synthetic memories with AI in an interactive art installation. Proceedings of the ACM on Computer Graphics and Interactive Techniques, 7(4). https://doi.org/10.1145/3664207

Zhang, W., Ren, D., & Legrady, G. (2021). Cangjie's Poetry: An Interactive Art Experience of a Semantic Human-Machine Reality. Proceedings of the ACM on Computer Graphics and Interactive Techniques, 4(2). https://doi.org/10.1145/3465619

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Industrial Materials to Support Kinetic Sculpture as Interior Elements

Lutse Lambert Daniel Morin[1*], Teerapon Hosanga[2]
**Corresponding Author*

[1] Fine Arts Study Programme, Faculty of Visual Arts ISI Yogyakarta, Yogyakarta, Indonesia
[2] Sculpture Department, Faculty of Painting Sculpture and Graphic Arts, Silpakorn University, Bangkok, Thailand

lutselambert@gmail.com; teeraponhosanga@gmail.com
Tel: +62 822 2034 4996

Abstract

Art plays a vital role in human life, not only as a source of beauty but also as a form of profound expression. Sculpture creates three-dimensional objects from various materials such as wood, stone, and metal. The aim is to discuss the process of designing kinetic sculptures from car engine waste, as well as assembly and splicing techniques using welding and screws. Optimizing function and aesthetics can contribute to environmental sustainability using industrial waste materials. This research is expected to guide the design of three-dimensional sculpture art in the context of industry and education to contribute to contemporary art's development.

Keywords: Industrial materials; kinetic sculpture; interior elements; fine art

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6150

1.0 Introduction

Designing kinetic sculptures using waste material is a part of enhancing environmental sustainability, and discussing techniques and material waste is supposed to guide artists to be aware of sustainability. Art is needed in life. It provides the value of beauty that attracts the attention and feelings of everyone who sees it. Art is all kinds of beauty created by humans. It is a product of beauty, a human effort to make beautiful things that can bring pleasure. Sculpture art is an essential development of art history and artifacts. Zhou and Lian (2020) said that sculpture has historically been a decorative object in a garden. Sculpture art is inextricably linked with architecture, gardens, religion, cemeteries, folk art, etc.

Art originated from human expression (artist) and was aimed at bringing enjoyment. A work of art is created from the artist's hand due to self-expression. Eco-materials or environmentally friendly materials can be renewed and recycled, requiring little energy (Hartini et al., 2020). One type of artwork that is three-dimensional is sculpture art. As part of fine art, the sculpture is an artistic and aesthetic statement through a three-dimensional form. This sculpture uses various media, including wood, stone, and metal. The three-dimensional works discussed in this article are multiple forms of metal sculptures produced from former industrial machines, namely car

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6150

engines. The engine of this car is assembled into a kinetic sculpture and developed by combining it with interior elements in the form of furniture.

Technology and industry are developing quite rapidly in this era. One of the technology and industry is the automotive industry. Throughout 2019 alone, the production of four-wheeled motor vehicles reached 1.28 million, and two-wheeled vehicles reached 7.29 million units. These motorized vehicles appear with models or types that continue to evolve so that new types or models will always appear. The emergence of production with new types or models makes old types or models of vehicles begin to be abandoned. Sometimes, even when damaged, it is no longer repaired but used as a scraping item. Maintaining an old vehicle is usually more expensive than buying a new one because spare parts that have yet to start to be produced trigger the high cost of maintaining old vehicles. The work design uses car engine materials that are no longer used or have become waste as the primary material, which will be a unique form of combining technology and art. Car engines are converted into interior elements in shape or function as motor drive engines. The combination of waste industrial machinery, sculpture, and interior art will give rise to a new work of art that is not only a display but can function as furniture that can build an atmosphere of enthusiasm for work. Sculptures with car engine materials can add a reference for creative thinking in the atmosphere of the space. According to Jung & Lee (2019), The 3D sculpture education model of automotive design proposed in this study is expected to be applied and added to automobile 3D sculpture education for classes in various fields.

The mechanical functions of the car are still used. This is because it is considered that car engines have a certain uniqueness that they want to bring out in interior elements. These machines are mechanically functioned using custom-designed aids and modified existing mechanics. Mechanical movements are made using electrical power converted into motion through a dynamo or electric motor. The dynamo was the first electric generator capable of delivering power for industry, and it is still the most critical generator in use in the 21st century. Dynamos use the principle of electromagnetism to convert mechanical rotation into alternating current electricity. This electric dynamo will later be used to drive the car engine's gears to create a motion display on the three-dimensional statue.

The Whitney Museum of American Art, New York, owns one of the most significant motorized works by the renowned American artist Alexander Calder, titled Half-Circle, Quarter-Circle, and Sphere. Created in 1932 and acquired by Whitney in 1969, this seminar work was featured in an iconic exhibition held in 2017 entitled Calder: Hypermobility. (Pozzi et al., 2020). Creation of kinetic works using various engineering equipment. While the work's mechanism retained its creator's ingenious engineering solutions, the motor, urethane belts, plug, and electrical wires were neither original nor authentic to the period. (Huang et al., 2009). Knowledge of the types of industrial materials is fundamental in producing this three-dimensional work because not all industrial materials can be formed into kinetic sculptures with the theme of industrial space. The materials that are prepared must pay attention to comfort and safety for the user the need to implement the priority requirements of different level users to the spatial planning structure of the stop complex, such as transparency, control, protection, safety, accessibility, information, rational use of space, comfort, and services; (Gnatiuk & Novik, 2018)The wrong selection of industrial materials will damage the shape of the kinetic sculpture, turning it into a sculpture without a concept. Industrial machines usually have simple mechanical systems and high technology. Industrial materials that can be used in this three-dimensional work are machines with mechanical systems such as gears and motors. In addition, machine waste that can be used is metal-based because metal can be welded or firmly in couplers.

In composing industrial materials, one must pay attention to the mechanical components displayed and driven simply by electrical or manual power sources in a new form. Industrial materials with simple mechanics can be displayed as the central part of the sculpture's shape. Simple assembly and splicing in composing industrial materials must pay attention to the mechanical components displayed and driven simply with electrical or manual power sources in a new form. The technique that can be used to form this three-dimensional work is simple assembly and splicing, not damaging the industrial material's original shape.

Simple splicing techniques that can be used are welding and screws. Welding is a metal joining technique that involves melting part of the parent metal and filler metal with or without pressure and with or without additional metal and producing a joint. Welding is a metal joining technique that involves melting part of the parent metal and filler metal with or without pressure and with or without adding metal and producing a joint. According to the definition of DIN (Deutch Industrie Normen), welding is a metallurgical bond on an alloy metal joint that is carried out in a molten or molten state.

A bolt or screw is a rod or tube with a helical groove on its surface. Its primary use is as a fastener to hold two objects together and as a simple plane to convert torque into linear force. Bolts can also be defined as inclined planes that wrap around a rod. Most bolts are tightened by turning them clockwise, called the right thread. In three-dimensional art, screws or bolts are commonly used to connect one part of the sculpture to another. Thus, in the creation of this work, the researcher uses screws to unite the parts of the machine until it becomes the desired shape.

2.0 Literature Review

Beyond aesthetic or communicative functions, art serves as a tool to provoke new perspectives on exploration and introspection, both on an individual and societal scale. Art is a work that is meant to stimulate emotions, both through perception and understanding (Hays et al., 2020). End-of-life vehicles (ELVs) are a problem that cannot be solved through simple disposal, as they are considered hazardous with the potential to pollute the environment and as a spatial problem that generates about 5% of waste industries worldwide. Now, more than ever, in contemporary industries, an essential prerequisite for developing an efficient ELV recycling model as a reverse supply chain must align with environmental requirements and long-term sustainability goals. (Petronijević et al., 2020) This triggers artists to create vehicles that are no longer used in three-dimensional works. Some existing works of art are the trigger for several individuals and artists who ultimately create materials to be turned into art items. The uniqueness of this shape attracted several people to make it work.

Not only are artists interested in processing car engines into works, but automotive lovers are also interested in making this part of the car into an object or work. They work just as a hobby or take advantage of used car parts that are said to be thrown away. The works these automotive lovers produce are usually objects that can function, such as tables, lamps, etc. The resulting shape is also simple: just an engine block or a part of the car on which glass is given to function as a table. In addition to tables, some turn engines, such as pistons, into clocks. This work is elementary and only attaches the clock to the engine part, such as the piston. Another form that is often produced is the yaou lamp. The engine or car part is combined and given a lampshade to form a work as a sleeping lamp.

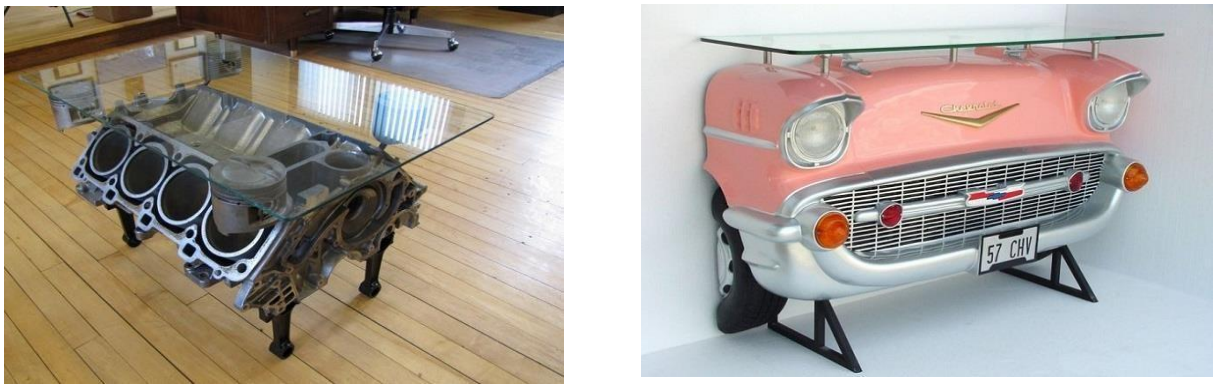


Fig. 1: The image of the Table from automotive machine
(Source: https://berita.99.co/kreasi-barang-bekas-mobil/, 2024)

Fig. 2: The image of the Table lamp (left) and Table watch (right) from the automotive machine.
(Source: https://id.pinterest.com/pin/706431891525097999/; https://www.pinterest.co.uk/pin/663436588835365341/, 2024)

Fig. 3: The image of the Billiard from the automotive machine.
(Source: https://www.viva.co.id/foto/510218-kala-mobil-mobil-sangar-disulap-jadi-meja-billiard, 2024)

In addition to works produced by automotive lovers, some artists are interested in using engines or car parts to make three-dimensional works. Artists who use car waste include James Corbett and Rudolph de Harak. They assemble car engines into three-dimensional works that have a high selling value. The works produced are of high aesthetic value but cannot be used in the household. The work is only made to be displayed and enjoyed for its beauty. One of James Corbett's works is The Green Kawasaki Grasshopper,

displayed at Sydney's new Oran Park library. This work is in the form of a giant locust pasted on the wall to give the impression of life. The engines of cars and motorcycles are assembled in such a way that they form grasshoppers. In addition to The Green Kawasaki Grasshopper, James Corbett also produced several unique works made of car engines. His works are always in realist form or resemble living objects such as humans or other stars.

Fig. 4: The image of The Green Kawasaki Grasshopper, new Oran Park Sydney (left) and Paddy's Tractor, Sydney (right) by James Corbett *(Source: https://jamescorbettart.com/2018/10/october-2018/, 2024)*

Rudolph de Harak is an artist from California. Almost all of his work is installation work using machines. One of his works is Exploded Engine, which is an installation work. Rudolph used several car engines as objects or materials for his work. According to his created concept, these machines were arranged and hung from the ceiling.

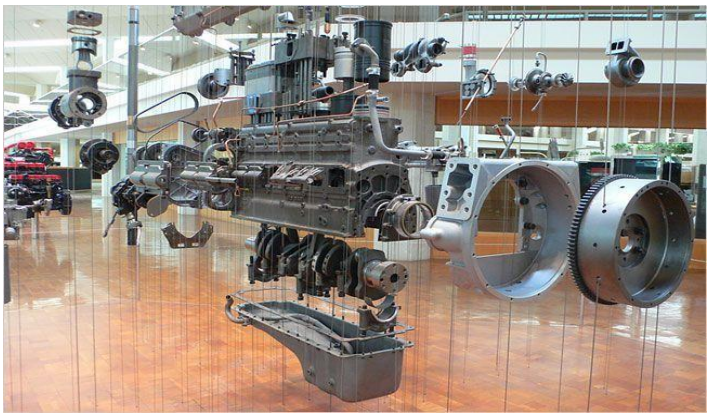


Fig. 5: The image of The Exploded Engine, museum of Cummins by Rudolph de Harak *(Source: https://www.pinterest.co.uk/pin/25684660349816802/, 2024)*

Of all the works that have existed or have been created, there are no kinetic works made from car engines combined with interiors. Based on reviewing these previous works, the researcher will make a work different from the previous ones. The three-dimensional artwork made by the viewer is a work of art that combines sculpture art with the interior, namely the table. The work presented is not only a display to enjoy its beauty but also has a function. In addition, the three-dimensional work produced is also kinetic. The dynamo engine will be used to drive the engine or motor of the car.

3.0 Methodology

This study's methodology refers to the Design Action and Practice Research Model (Swann, C., 2002). This methodology creates kinetic sculptures that incorporate used industrial materials as sculptures in interior elements. This research provides insight into designing and utilizing industrial materials in kinetic sculpture art and offers practical guidance for their application in interior design.

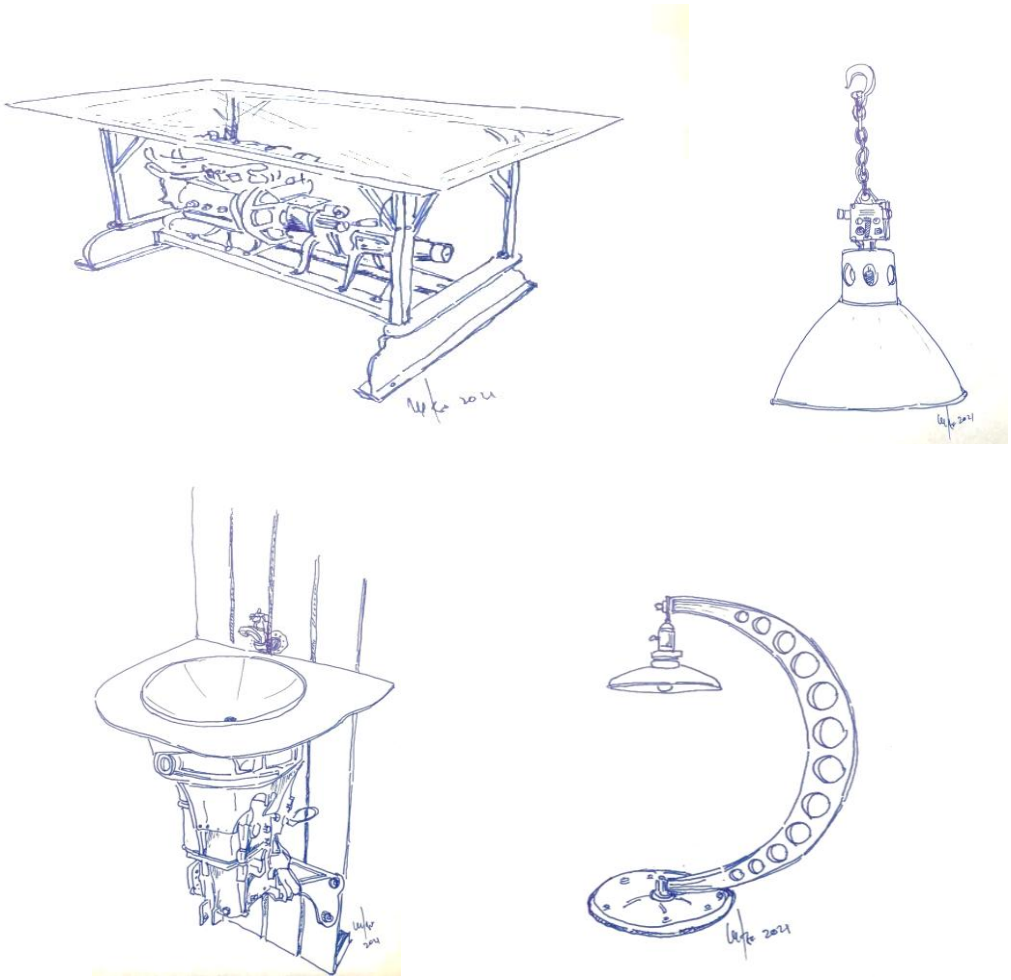
In realizing the research objectives explained in the background, Practice-led Research (PLR) applied research on kinetic sculptures that function as interior elements with car engine waste materials using the Design thinking: Art Exploration method. In the exploration stage, the researcher determines the theme of the creation idea to obtain a form that can adjust the space and compose between the sculpture and conventional interior elements, the process of thinking, imagination, taste, responsibility object, and interpreting the object from the found object and its assembly technique that does not eliminate the original form—the process of building the concept of creation or creating art. As a result of the concept of creation, the process of material exploration with experiments with new forms and

work techniques is focused on the aesthetic work of the function of the artwork in the interior space. The stage of forming a work of art is creating a new form by combining elements of found objects produced from various explorations or experiments. The technical formation of work requires the ability to determine unity and other parameters (Hendriyana, 2018), as well as following the guiding principles and rules in the concept of environment-based artworks (Thornes et al., 2008); art exists in the development of human beings' civilization as an essential part of human life. Colorful kinds of art can reflect human emotion, bringing them aesthetic pleasure and creating a variety of enlightenments for human beings. (Wang, X., 2016). This research is applied to three-dimensional art production (Ethical and Aesthetic Interaction in Environmental Art). There are three claims: (1) the proper ethical criticism of environmental art requires a production-oriented approach—an approach that appraises the ethical merits or flaws of the work in terms of how the artwork is created as well as the consequences of its creation; (2) that, depending on contextual factors, ethical flaws in environmental artworks may, but do not necessarily, constitute aesthetic flaws in those works; (3) that because environmental artworks appropriate part of the environment as an aspect of their identity, an aesthetic flaw in an environmental artwork necessarily also creates aesthetic disvalue in the environment—disvalue that exists in virtue of the creation of the artwork (Nannicelli, T., 2018). The goal is to produce environmentally reused-based sculpture artworks from the results of industrial processes, which are then created into new forms and presented in interior elements.

4.0 Findings

This research shows that industrial waste materials that concentrate, especially car engines, can be transformed into kinetic sculptures that function as fine art and functional interior elements. The material transforms into a new shape that maintains aesthetic and functional value. Between aesthetics and function, kinetic sculpture and interior elements are combined to create an aesthetic and inspiring space. Kinetic sculptures designed with scrap materials show how art can combine function and beauty in an interior context.

This research contributes to the understanding of environmental art by recycling industrial materials into artworks with an aesthetic and environmental impact. This is in line with the principles of ethical and sustainable art production. Looking from the perspective of interior design, it offers a practical guide to using kinetic sculptures as interior elements, integrating art and design to create a more inspiring environment, and evoking a sense of memory in the process of newness of the form of found objects that were once nostalgic according to their original function.



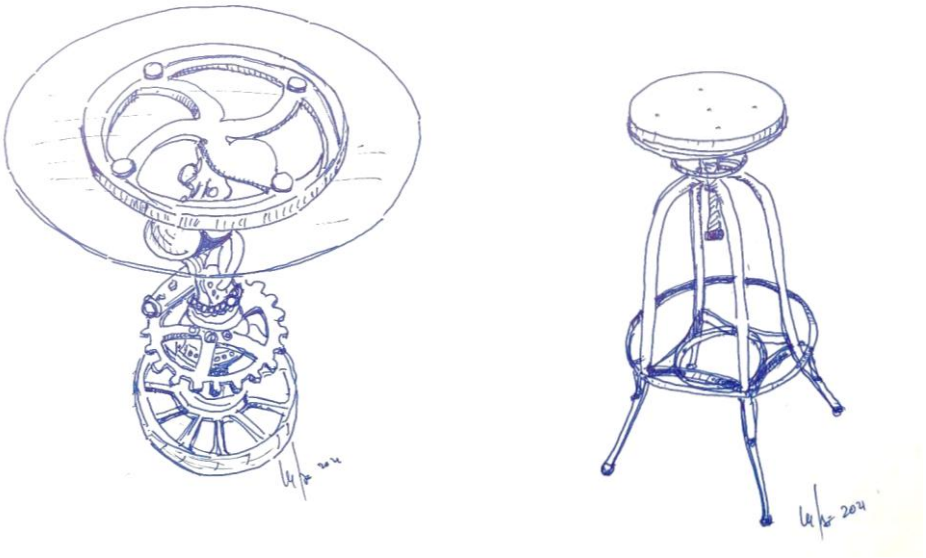


Fig. 6: The Creating Concept of Kinetic Sculptures as Interior Elements
(Source: The authors)

5.0 Discussion

Using used car engine materials to design functional sculptures shows how art and design can complement each other. The resulting kinetic sculptures enrich the visual experience and provide practical benefits in interior spaces. This shows great potential for innovation in the use of waste materials. Upcycling can combine various elements in one solid object, creating a unique and memorable design. This process protects the sentimental value of existing items and transforms them into new forms. Thus, upcycling gives interior spaces an elegant and aesthetic touch, while recycling increases the value of authentic items. (Ali, Nawwar Shukriah, et al, 2013)

6.0 Conclusion and Recommendations

The main challenges in the project included assembling complex scrap materials and ensuring the safety and stability of the functional sculptures. The solutions implemented include careful assembly techniques and special tools to ensure the sculptures function properly and safely. In modern society, we cannot avoid the influence of global popular culture, which has led us to excessive consumption patterns. With the rise of advertising and promotion, commodities are now judged based on their usefulness and the meaning and symbols they contain. As Jean Baudrillard notes in his work, the nature of our consumption often goes beyond basic needs and becomes a form of persistent dissatisfaction. (Waring J, Bishop S., 2015, p: xxiii) In a consumer society, the object of consumption is often defined by its relationship to a system of social signs and values rather than its actual function. Excessive consumption leaves a significant environmental impact, including the accumulation of waste that threatens the quality of human life. Waste, although often considered an enemy of the environment, can also have value if appropriately managed. In this context, art can influence our perspective on waste and provide creative solutions. Art can be a vehicle to explore and change people's views on waste. Sugiharto argued that art follows trends or media and adapts to evolving social and cultural contexts. In a society faced with the problem of waste, art can be present as a productive and creative form, transforming waste into aesthetic and functional works. (Sugiharto, 2013) Creating art with recycled materials, such as waste-based paints, adds a new aesthetic dimension. This aesthetic is rooted in the honesty of materials and the principles of popular culture that often emphasize surface values and pleasure. Art provides space for creativity and inspiration, serving as an oasis amidst the burdens of everyday life. Artworks that use waste as a material can symbolize innovation and environmental awareness. Recycled art expands aesthetic possibilities and serves as a medium of reflection and a solution to environmental problems. Artwork made from waste materials can show that art is not separate from environmental issues but can contribute to awareness and solutions to these problems.

Paper Contribution to Related Field of Study

This research is expected to guide the design of three-dimensional sculpture art in the context of industry and education to contribute to contemporary art's development and the artisan.

References

Ali, Nawwar Shukriah, Nuur Farhana Khairuddin, Shahriman Zainal Abidin, (2013). Upcycling:Re-Use And Recreate Functional Interior Space Using Waste Material. International Conference On Engineering And Product Design Education, pp. 798-803. Dublin: Dublin Institute Of Technology, Dublin, Ireland.

Gnatiuk, L., & Novik, H. (2018). Metal in the design of public transport stops. MATEC Web of Conferences, 170, 1–8. https://doi.org/10.1051/matecconf/201817003008

Hartini, L., Wibawa, B., Situmorang, R., & Raissa, F. (2020). Interior design of national library with environmentally sustainability materials. IOP Conference Series: Materials Science and Engineering, 1007(1). https://doi.org/10.1088/1757-899X/1007/1/012004

Hays, K., Kubli, C., & Malina, R. (2020). Creativity and Cognition in Extreme Environments: The Space Arts as a Case Study. Frontiers in Psychology, 11(September), 1–10. https://doi.org/10.3389/fpsyg.2020.575291

Hendriyana, H. (2018). Metodologi Penelitian Penciptaan Karya. Bandung: Penerbit Sunan Ambu Press. ISBN, 978-979

Huang, Z., Conway, P. P., & Qin, R. (2009). Modeling of interfacial intermetallic compounds in the application of very fine lead-free solder interconnections. Microsystem Technologies, 15(1 SPEC. ISS.), 101–107. https://doi.org/10.1007/s00542-008-0629-9

Jung, A., & Lee, K. (2019). Communication-oriented automobile design by a three dimensional sculpture educational model: Narrowing the gap between company work and education system. Archives of Design Research, 32(2), 71–88. https://doi.org/10.15187/adr.2019.05.32.2.71

Nannicelli, T. (2018). The interaction of ethics and aesthetics in environmental art. The Journal of Aesthetics and Art Criticism, 76(4), 497-506. https://doi.org/10.1111/jaac.12601

Petronijević, V., Đorđdević, A., Stefanović, M., Arsovski, S., Krivokapić, Z., & Mišić, M. (2020). Energy recovery through end-of-life vehicles recycling in developing countries. Sustainability (Switzerland), 12(21), 1–26. https://doi.org/10.3390/su12218764

Pozzi, F., Arslanoglu, J., & Nagy, E. (2020). Alexander Calder's Half-Circle, Quarter-Circle, and Sphere (1932): a complex history of repainting unraveled. Heritage Science, 8(1), 1–14. https://doi.org/10.1186/s40494-020-00419-7

Sugiharto, Bambang (ed.). (2013). Humanisme dan Humaniora, p. 28-29. Bandung: Pustaka Matahari.

Swann, C. (2002). Action Research And The Practice Of Design. Design Issues, 18(1), 49-61

Thornes, J. E. (2008). A rough guide to environmental art. Annual Review of Environment and Resources, 33, 391-411. Doi: 10.1146/annurev.environ.31.042605.134920.

Wang, X. (2016). Ecological art education. The Anthropologist, 25(1-2), 109- 116. https://doi.org/10.1080/09720073.2016.11892095

Zhou, X., & Lian, X. (2020). Discussion on Development Trend of Landscape Sculpture Based on Big Data Analysis Method. Journal of Physics: Conference Series, 1550(3), 032035. https://doi.org/10.1088/1742-6596/1550/3/032035

Waring J, Bishop S. George Ritzer. (2015). Rationalization, Consumerism and the McDonaldization of Surgery. In: Collyer F (editor). The Palgrave Handbook of Social Theory in Health, Illness and Medicine, pp 488-503. New York: Palgrave Macmillan. doi: 10.1057/9781137355621_31

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Subjectivity, Objectivity Culture in Art Axiological

Wan Samiati Andriana W. Mohamad Daud[1*], Zuriati Mohamad Shaari[1], Nik Syahida Sabri[1], Yulriawan Dafri. M.Hum[2]

**Corresponding Author*

[1] College of Creative Arts, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia
[2] Faculty of Visual Arts, Indonesia Institute of the Arts, Yogyakarta, Indonesia

samiati@uitm.edu.my, zuriati9216@uitm.edu.my, niksyahida@uitm.edu.my, yulriawandafri@isi.ac.id
Tel: +60122750539

Abstract

This article explores the dynamic interplay between subjectivity and objectivity in art axiology, highlighting the challenges of evaluating art today. It examines the importance of balancing these dimensions to comprehensively understand art's value and meaning. Through case studies and examples, it discusses how contemporary artists and critics navigate this duality using digital media and interactive technologies while considering formal elements, historical context, and cultural significance. The article addresses ethical considerations, such as cultural appropriation and inclusivity, and concludes that balancing subjectivity and objectivity enhances our appreciation of art's personal and cultural dimensions.

Keywords: Art; axiology; objectivity; subjectivity; culture

eISSN: 2398-4287 © 2024. The Authors. They are published for AMER and CE-Bs by e-International Publishing House, Ltd., UK. This is an open-access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under the responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and CE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6155

1.0 Introduction

Art has been a place where subjectivity and objectivity were blurred, creating a rich tapestry of discourse within the field of aesthetics. The perennial question of whether art is an entirely subjective expression of the individual artist's inner world or an objective entity subject to universal standards has intrigued philosophers, artists, and scholars for centuries. This intricate interplay between subjectivity and objectivity in art axiology forms the cornerstone of exploration in this paper. Exploring into the world of aesthetics, navigating a landscape marked by diverse viewpoints, historical shifts, and evolving artistic movements. From the transcendent musings of Immanuel Kant to the revolutionary declarations of Clive Bell, the discourse on subjectivity and objectivity in art has spanned centuries and continues to shape our understanding of what constitutes art and how it should be evaluated.

This article embarks on a philosophical journey in art axiology to unravel the complex relationship between subjectivity and objectivity. The purpose is to examine how personal emotions, experiences, and cultural contexts infuse art with subjectivity while reviewing the criteria and standards that aim to establish objectivity in artistic evaluation. Examine the ever-shifting nature of this discourse by case studies and contemporary perspectives. The primary objective of this research article is to critically examine and elucidate the complex interplay between subjectivity and objectivity in art axiology, focusing on their historical evolution, philosophical

eISSN: 2398-4287 © 2024. The Authors. They are published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open-access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under the responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and CE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6155

underpinnings, and contemporary relevance. This paper shall contribute to the ongoing conversation about the nature of art, its values, and the intricate balance between subjectivity and objectivity that defines its place in the realm of human expression and culture.

2.0 Literature Review

Axiology is one of the oldest fields of study. It can be traced back to ancient Greek philosophy, especially the great Greek philosophers, including Socrates and Plato. An axiology study principally contains two kinds of values: ethics and aesthetics. According to Saracevic and Kantor (1997), the theory of value, or axiology, is the branch of philosophy that deals with the nature of value and valuation. Philosophers consider value as the worth of something, and the valuation process is an estimate, appraisal, or measure of its cost. In their works, it is what seems to be an undefined primitive term. They consider values related to, but not synonymous with, "good," "desirable," or "worthwhile," which can be positive or negative. The theory of value in philosophy refers to the problems of ethics and aesthetics, where the meaning of ethics has two meanings: a set of knowledge concerning the assessment of human performance and a predicate, which is used to distinguish works, conduct, or otherwise. Art Axiology, the philosophical study of the worth of art, frequently confronts the conflict between subjectivity and objectivity. The tension is caused by the fact that art is both a deeply personal and subjective experience, and it can also be evaluated and critiqued using objective criteria. Mohd Johari (2013), in his book about the Relationship of Art, Philosophy, and Aesthetics, wrote that a German philosopher named Alexander Baumgarten (1714-1762) was the person responsible for coining the term aesthetic, borrows from the Greek word 'aesthesia', which means perceive. There was also an opinion stating that the aesthetic is derived from the Latin word 'aesthetics, ' which means trained in perceiving. In the English language, aesthetics is defined as the people who are trained to create the perception.

This is consistent with the ideas raised by Supangkat and Zaelani (2006) that the term aesthetic was given a new meaning in 1735 by Alexander Baumgarten. This aesthetic judgment means to evaluate, feel, and appreciate something genuinely or deeply. The word aesthetics comes from the ancient Greek aesthetic, which means perception. According to Djelantik (1999), beauty covers natural beauty and artificial beauty that, in general, we call art. Thus, art is one of the platforms that contains elements of beauty. Hamidah Abdulhamid (1995) argued that Baumgarten did not contribute much in giving opinions about aesthetics; instead, the philosopher who formed and streamlined the definition of aesthetics was George Wilhelm Friedrich Hegal (1770-1831). Hegal was a German philosopher who often used the term aesthetic in his writings on art.

In addition, Shaari (2001) wrote that aesthetics in literary works means the value of beauty. The meaning of value here relates to human feelings and is subjective. For example, the first reader might consider one's work as aesthetical work, but the other reader might not think so. Therefore, according to Shaari (2001), technique and style determine the aesthetic value of a work. Even with the presence of good content in a work, it does not necessarily guarantee a high aesthetic value of that work, but the more important is there must be a balance in every work.

Djelantik (1999) explained that aesthetics is a field of science that studies all things related to beauty. Beauty in the soul generally creates a feeling of ease, contentment, peacefulness, comfort, and happiness. When these kinds of feelings become very strong, one will start to feel transfixed, overwhelmed, and fascinated, creating a desire to have the same experience of feelings again.

In their article, Hussin et al. (1987) argue that the word aesthetics comes from the word 'aisteikos', meaning sensitive, and this word evolved from the word 'aisthamnesthai', which means to perceive (perception). It is also mentioned in his book Aesthetics from Classical Gress to the Present, that aesthetics is a branch of philosophy of beauty in which the criteria of perception on the external appearance of an art are reviewed or evaluated.

Furthermore, Ali mentioned in Hussin et al. (1987) that aesthetics derived from Greek sources are related to the sense of observation that involves the eyes' ability to see. While enjoying the aesthetics of the art object, the eye, as an organ of vision, is one of the senses that can evaluate the aesthetics. In this context, aesthetics, according to Socrates, involves imagination, and this process of imagination is how someone enjoys and appreciates a work that involves feelings and emotions.

3.0 Methodology

Case Studies and Contemporary Perspectives can help investigate how subjectivity and objectivity manifest in contemporary art and aesthetics, with a particular emphasis on selected case studies and the viewpoints of modern artists and critics. This attempts to connect historical concepts with current artistic practices and debates. Finally, Contribution to Discourse contributes to the ongoing discourse on art axiology by offering fresh insights and perspectives on the enduring tension between subjectivity and objectivity in evaluating and understanding art. This contribution explores the implications of digital media and globalization on contemporary art's subjectivity-objectivity dynamics.

4.0 Findings

Aesthetic value, the capacity of an artwork to elicit pleasure or displeasure, plays a crucial role in balancing subjective and objective evaluations in contemporary art. The ability of a piece of art to trigger either pleasure or unhappiness is referred to as its aesthetic value. In contemporary art, aesthetic value plays a significant role in maintaining a balance between subjective and objective evaluations.

Everything valuable is valuable in a diversity of ways. Art objects often have sentimental value, historical value, or financial value. Wilderness can have economic and recreational value. However, great artworks are considered to own a distinctive form of non-

instrumental and non-utilitarian value that is of fundamental concern when judged as artworks. It might be supposed that this value is beauty, but many artworks are not beautiful. Thus, it is more plausible that beauty is a particular value of the species.

Aesthetics can make someone pleased when they see (look) and observe an object of study. In short, aesthetics can be summarized as the philosophy of beauty, even though the whole discussion about aesthetics is from its philosophical view. From the period of philosophy, aesthetics has a broad scope and is arguably infinite. Generally, a work of art results from humans' vision and creative process of creating beauty by doing something.

And once more, the emphasis on pleasure and displeasure has consistently challenged the objectivity of aesthetic and aesthetic value judgments. However, although some believe aesthetic value is a purely personal preference, there has always been a robust philosophical resistance against such radical subjectivism.

The values and judgments associated with artworks are shaped by subjectivity and objectivity. The complexity of art evaluation is often caused by the interaction and influence between these two elements. Art evaluation is a complex process that involves a dynamic interplay between subjectivity and objectivity. Subjectivity is the personal experiences, emotions, and individual perspectives that viewers bring to their encounters with artworks. Objectivity requires using more impartial and analytical criteria, such as formal elements, historical context, and cultural significance, to assess artistic quality.

Objective or subjective value highly depends on the results emerging from the view of philosophy. As for the definition of metaphysical value, for example, it is how it values the relationship with reality. Among the questions raised in subjectivism, is value entirely dependent on and relative to the human experience of it? In objectivism, the logical value is the rational essence of substances, independent of their being known, yet not the existential status of action. And metaphysical objectivism, values, norms, or ideals are an integral objective and active constituent of the metaphysical realm. Broadly, values can be categorized as either material values or spiritual values. Material values refer to the values of people's daily necessities, such as commodities. Spiritual values, in contrast, refer to values corresponding to the faculties of intellect, emotion, and will or the values of sincerity, goodness, and beauty. However, values are viewed in the philosophy of the Islamic aspect and its implications for the history of Malaysian art in general and Islamic art in particular.

Philosophy emerged from the question of human will. This refers to the philosophical thought of man, which can also be considered a philosophy of human beings. Human philosophy is a branch of philosophy that deals with the meaning of being human. Philosophy of artificial man as the object of his studies. The philosophical starting point is human knowledge, experience, and the world enclosing them. Human philosophy continues to flourish because the human being is an object filled with mystery. In history, some terms have led to human philosophy: rational philosophy, psychology, experimental psychology, and empires.

National unity is the cornerstone of the well-being and prosperity of the country. The fact that Malaysians are of various races, religions, and cultures and come from different provinces makes the question of unity fundamental in ensuring national development goals.

5.0 Discussion

Today, Malaysia is recognized by the world for its success in creating unity in a plural society. Yet, strengthening national unity should be continuously performed because, over time, it brings together a range of new challenges that could affect national unity. Ethnic groups often differ in culture, customs, clothing patterns, views on beauty, political and economic activities, and entertainment orientation. In Malaysia, the Malays, Chinese, Indians, Kadazan, Melanau, and many others may be regarded as ethnic groups. Ethnic being ethnocentric, which considers the cultural traits as reasonable, correct, and more mainstream than the other ethnic cultures that are considered low and debased, called odd, low level, or immoral.

Race and ethnicity are often used in place of each other, even if they carry different meanings. In Malaysia, racial and ethnic terms are frequently conflated and used so that their meaning becomes the same. The Malays, Chinese, and Indians are duly recognized as ethnic groups but are also called races in daily life. Race is the difference in terms of physical traits in human groups, and the most striking and often used feature to distinguish human groups is skin color. On the other hand, in terms of ethnicity, languages can be defined as ethnic or racial. Ethnicity can be determined through differences in cultural characteristics such as customs, clothing, language, economic activities, etc.

Ethnic groups, about people, do not force changes to religious beliefs or remove the elements of a person. Ethnic groups usually start from a concept of descent, which is that a generation of ethnic groups today have the same ancestors and generations of their ancestors. Ethnicity is unclassified through cultural differences. In addition, ethnicity can also be classified according to demographics, such as geographical position and the state's boundaries. For example, in Sabah and Sarawak, there are many ethnic groups in different geographical positions.

This demographic classifies the cultural differences of ethnic groups. This clearly shows that each ethnic group has artistic differences from other ethnicities. In culture, the most essential factor is religion because religion is the notion of a policy of the environment regarding the social and physical. Language is also important as a means of communication, and customs are also necessary as an indicator of how someone conducts his life and society's culture. There are two prominent roles in forming a culture: firstly, to build the country's image towards creating a personality and identity. The second is cultivating national consciousness and nationalism based on spirituality, humanitarianism, spirituality, and mentality.

Culture is universal, but paradoxically, at the same time, there is a difference between the culture of one society and another community. Something in the culture evolved and continued to be created according to the people's willingness. There is a culture that matches in the event of a collision with an external influence, whether to fill a vacancy as an alternative or exaggerate what already

exists. Then, man's culture and cultural development evolve according to the progress of society itself. Culture is shared by people who become members of the community. This partnership means that each act is backed up by many links. For example, nasi lemak and roti canai became a culture because society loves it. The Malay language is the culture of Malaysians and is spoken in everyday life. However, behavior is not shared by a group of humans and is not included in culture, such as stealing, even if it exists in the community. Without sharing, it is just individual behavior rather than the conduct of society.

Culture is inherited from one generation to the next generation. This means that the culture of Malays, ethnic Chinese, and Indians today is an extension of the previous culture. Events that have taken place will have an effect to this day. Culture is also inherited as a means of connecting. The technology produced today is the result of the human past. However, culture will change and has not existed before, and until now, that has stayed the same. Art and culture are two entities that are closely related and are suspended between each other. The scope of both these fields is vast and complex, and it is as if they cannot be separated. Arts and culture are very closely related to the identity, ideology, and practices of groups of people. Worldwide, every society has an identity of its own in culture and arts, forming the uniqueness of their way of life.

The arts have become an identity and practice essential to Malaysia's cultural society, which is a multiracial nation. With the diversity of the art practices of multi-ethnic societies in the country, multicultural Malaysia's identity has become more recognized and recognizable. Undoubtedly, things asserted in visual art production are creative activities involving objects that can be touched, seen, and imagined, encouraging the development of perception and intuition. Philosophy can be adjusted to promote understanding of the real and the abstract in art, and interest in the visual arts can be developed. History and appreciation of visual arts concentrate on experiencing art in daily life and the national culture. Comparison with art and culture from outside are also encouraged to expose the balance the exposure in the field of the visual arts to recognize the visual arts in the cultural evolution of nationalities.

It is hoped that through visual arts, generations of Malaysians will be literate in culture, have high aesthetic values, be critical, creative, imaginative, innovative, and inventive, as well as explore thought, exploration, and design in a wide range of visual arts to allow the development of ideas and self-expression. This is a necessary experience because it helps one build self-confidence, make an assessment, and learn how things feel on their own.

6.0 Conclusion

This paper contributes to the field of art axiology by examining the intricate balance between subjectivity and objectivity in evaluating art. Tracing historical and philosophical debates from thinkers like Immanuel Kant and George Wilhelm Friedrich Hegel, it connects these foundational ideas to contemporary practices. The paper defines aesthetic value as a blend of personal emotions and objective criteria illustrated through case studies and modern perspectives. It explores how digital media and globalization influence the subjective-objective dynamics in art. Additionally, it emphasizes the importance of cultural appreciation and creative thinking. This study enriches ongoing discussions about the nature of art, its values, and the balance between personal and universal standards in its evaluation.

7.0 Paper Contribution to Related Field of Study

This paper explores the balance between subjective and objective criteria in art evaluation. It traces historical philosophical perspectives and connects them to contemporary practices in art criticism. By analyzing how personal experiences and emotions interact with universal standards like formal analysis and cultural context, the paper offers a framework for understanding the complexity of aesthetic value. This approach is relevant to modern debates on artistic value, especially in the context of digital media and globalization.

Furthermore, the paper addresses ethical considerations like cultural appropriation and inclusivity, emphasizing the role of art in promoting cultural understanding. It examines how contemporary digital platforms impact the way art is perceived and evaluated, contributing to discussions on the evolution of art criticism in a globalized world. The study enriches the field by offering a nuanced perspective on the balance between personal and universal criteria in evaluating art, making it a valuable resource for understanding the evolving standards of art appreciation.

Acknowledgments

The authors thank the College of Creative Arts, Universiti Teknologi MARA (UiTM) Shah Alam, Malaysia, and ReNeU UiTM for funding the publication incentive and the writing workshop.

References

Abdulhamid, H. (1995). Pengantar Estetik. Kuala Lumpur: Dewan Bahasa dan Pustaka.

Djelantik, A.A.M. (1999). Estetika Sebuah Pengantar. Bandung: Masyarakat Seni Pertunjukkan Indonesia.

Hamid, M. J. A. (2013). Falsafah dan Kritikan Seni. Perak: Universiti Pendidikan Sultan Idris.

Hussin, H., Mansor, S. A., Omar, R., Ismail, H., & Hassan, A. (1987). Seni, Seni Hias, Seni Reka Bentuk dan Estetika Darpada Persepsi Umum dan Orang Melayu. (General and Malay Perception of Art, Decorative Art, Art Design, Design and Aesthetics). Retrieved January 2, 2024, from http://e-journal.um.edu.my/filebank/published_article/2498/841.pdf.

Saracevic, T. & Kantor, P. B. (1997). Studying the Value of Library and Information Services. Part I. Establishing a Theoretical Framework. Journal Of the American Society For Information Science. 48(6).

Shaari, R. (2001). Bimbingan Istilah Sastera. Utusan Publications & Distributors Sdn Bhd.

Supangkat, J. & Zaelani, R. A. (2006). Ikatan silang budaya: seni serat Biranul Anas. Ebook: Kepustakaan Populer Gramedia.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Relevance of Applying Design by Participation Method in Design Learning in Higher Education

Suastiwi Triatmodjo*, **Mahdi Nurcahyo**

**Corresponding Author*

Institut Seni Indonesia Yogyakarta, Yogyakarta, Indonesia

triatmodjosuastiwi@gmail.com, mahdinurch@gmail.com
Tel: +62 8156856644

Abstract

Design is crucial to reconciling the interests of improving human life while maintaining environmental sustainability. A suitable design approach to achieve this is the design by participation (DbyP) method. This method focuses on providing solutions based on various needs, requires active user involvement in the development process, and places designers as facilitators. It has yet been widely taught and practiced by students at design universities. The article intends to write DbyP as a design method to achieve community prosperity while providing a sustainable living environment, as well as conveying proposals for integrating this method into the design university learning process.

Keywords: *Design by participation; human well-being; sustainable development; learning process*

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6157

1.0 Introduction

Environmental problems are becoming increasingly complex and complicated. In a situation like this, it is necessary to mobilize various resources owned by the community to overcome it. Human resources, as well as various types of resources, such as information, natural resources, and socio-cultural ones, both global and local, are equally important. This work must also be done simultaneously and together by all elements of society. The role of students is also essential because, frankly, they are the ones most affected by environmental damage today, and in the future, they will have to work hard to find solutions to overcome it. UNESCO says that environmentally friendly schools and curricula are one of the best ways to overcome climate disruption in the long term (Kompas, July 2024). The aim is to empower the younger generation to play a fundamental role in overcoming the climate crisis and environmental problems in general.

This article aims to examine the feasibility of the design-by-participation (DbyP) method to be practiced by students at design universities. This is based on the idea that the DbyP method can be applied to overcome complex environmental problems, therefore this method needs to be taught to today's students -generation Z- so that they can later use it when working in society to overcome various environmental problems. The increasingly pronounced environmental crisis and frequent natural disasters have forced many

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6157

parties in society to look for appropriate solutions. Generation Z, born between 1997 – 2012, also needs this awareness. This generation is the one who feels the worst effects of the environmental crisis but also wants to participate in overcoming this problem (Husic, DW, 2024). Therefore, the discussion about making the ability to apply the DbyP approach more effective in design universities is getting the right moment.

The objective of this article is to integrate the DbyP method into learning at design universities. The author believes that integrating the DbyP method can provide more benefits, especially to students and society in general. The first reason is that Generation Z who are currently undergoing education or who are starting their careers are the backbone of society in overcoming environmental problems in the future. Both DbyP applications can be used to build original and sustainable community strengths because the DbyP practice explores and utilizes many social and cultural resources originating from the community itself. These two reasons are the basis for being able to practice the DbyP method on a massive scale in society, so that design can be a catalyst for overcoming environmental problems and at the same time achieving the goal of improving community welfare.

2.0 Literature Review

2.1 Design by Participation and Green Education

In the middle of the XX century, design by participation emerged when designers and architects integrated user feedback into their design process. This approach first appeared at the "Design Participation" conference organised by the Design Research Society in Manchester (Sanders et al., 2008). Then, DbyP was developed by many people from the business community; in 2004, the book "*The Future of Competition: Co-Creating Unique Value with Customers"* was written by C.K. Prahadad and Venkat Ramaswamy. Furthermore, it can be seen that this approach is not only playing out in the world of practice but is also being developed as *participatory design* and *user-centred research*. In principle, the DbyP approach emphasises the more active involvement of users, stakeholders, and communities in realising the final design product. With this way of working, a character of inclusivity, empathy, and interactiveness in finding solutions emerges.

A shift in design towards a human-centred methodology has reinforced the role of participatory practice as an essential part of the design process. Designers today routinely socialise and engage intensively with users through several methods characterised by participation, such as surveys, focus groups, workshop co-design, and usability testing. This direct user involvement not only aims to fulfil functional needs but goes beyond user expectations, produces something more intuitive, and provides different experiences. More than just improving usability, participatory design can encourage a sense of belonging, empower members and stakeholders, and encourage them to actively contribute to creating and refining solutions that will directly impact their lives.

In recent years, DbyP has developed in a community-focused area to address local challenges and amplify voices often marginalised in traditional design processes (Lee, 2007; Meroni & Fassi, 2013). Laboratory *co-design* in communities and participatory planning sessions became commonplace, where residents, activists, and experts collaborated to plan and implement solutions tailored to accurate and specific community needs. This approach encourages a deeper understanding of community dynamics and promotes sustainable development and social equality by prioritising local knowledge and real-world experiences in everyday life. With robust *participatory design*, communities can improve the shaping of their future, advocate for transformative change, and ensure that design outcomes genuinely reflect the diverse needs and aspirations of the stakeholders involved.

2.1.1 The Essence of Design by Participation

The essence of the DbyP approach lies in the "what," "how," and "who" designs (Sanders et al., 2008). The "what" of the design created in DbyP relates to the design solution. Rather than being dictated by designers or developers alone, as in industrial design, solutions in DbyP emerge through interactive dialogue and *co-creation with* participants. The process begins by identifying various user needs and aspirations through various methods such as ethnographic research, community surveys, or joint workshops. By understanding the nuances of user experience and the specific factors in the design context, designers can create solutions that directly address existing problems and give voice to audiences' latent intentions.

Meanwhile, the "how" question of design in DbyP focusses on methods and collaboration *tools* used when involving stakeholders in the design process. Techniques like design thinking, participatory design workshops, sessions co-design, and prototyping enable participants to contribute their insights, preferences, and feedback at various stages of product development. This method facilitates the sharing of understanding, fosters a sense of ownership of the final design result, and strengthens a sense of empowerment and commitment among participants. Furthermore, regarding "who" does the design, in DbyP, various stakeholders are involved in the design process. Each participant brings unique perspectives, knowledge, and skills that collectively enrich the design process and contribute to creating a broad, holistic solution. By providing a collaborative ecosystem where all voices are heard and valued, DbyP promotes equality, inclusivity, and social justice, ultimately leading to design that is more responsive to the needs of an increasingly complex society.

2.1.2 Green Education

Recently, UNESCO said that schools need to become greener. With this concept, besides teaching adaptation to environmental changes, schools also have a crucial role in encouraging green transition (Schleicher, A., 2024), namely change or economic growth and welfare of the world community that is environmentally friendly and sustainable. For this reason, they not only equip students with

knowledge but also *mindset* and motivation to overcome environmental degradation. Schools are essential for shaping students' competence in environmental sustainability. They can foster a genuine interest in environmental issues and equip students with the skills to act responsibly either now or in the future regarding the green transition. Now more than ever, it is essential to encourage environmental sustainability competencies in all students, as this is crucial for bringing about changes in the labour market (HR) and the social changes needed to fight the climate crisis.

While UNESCO campaigns for green education for all ages, Husic focusses more on reconceptualising green education for students in tertiary institutions (Husic, 2024). Due to the increasing severity and extent of environmental damage, Husic encouraged students to go directly into society. He also said that universities need to integrate the concepts of sustainable development and climate change into all students' curricula. By working with the community, students will gain authentic learning experiences and the opportunity to provide services to the community to build a sustainable living environment. Multidisciplinary collaborative work will bring students together with the community to increase knowledge about the environment, climate change, local disaster risks, and disaster mitigation strategies. This collaboration can also be used to develop a future vision and narrative about the community and its environment. These things will certainly provide many benefits to students, the community, and other stakeholders involved.

Another exciting article examines design students' involvement in community engagement (CE) activities. Montt-Blanchard et al. said that working with the community is excellent and needed by students, teaching staff, and higher education design. However, implementing community engagement in college faces several challenges (Montt-Blanchard et al., 2023). Namely, there are different settings between universities and conditions in the field, high dynamics of field situations, and difficulty in giving grades to individual students. Montt-Blanchard also outlined several ways to overcome this, such as organising the curriculum to adapt activities for community engagement, building collaborative networks with partners, building flexible communication between the parties involved, and more effective decision-making patterns.

Nowadays, the relevance of implementing DbyP by design students is related to the increasingly intense environmental degradation and the desire to involve all elements of society in extensive work to overcome environmental problems. The DbyP approach is significant in overcoming environmental problems by integrating various strengths of thought, local knowledge, local socio-economic resources, and actual actions, especially from students and stakeholders. The following section presents several reasons why the DbyP approach can have a natural effect and impact on overcoming environmental problems.

1. The DbyP approach involves direct collaboration with the community, increasing understanding of the context, leveraging local knowledge, and ascertaining the real problems.
2. Community involvement in finding solutions or *co-creation* can encourage behaviour change and adopting sustainable living practices.
3. Implementing DbyP stimulates the growth of joint creativity and innovation, such as collaborative ideation, allowing unusual and unique ideas to emerge.
4. If working with stakeholders goes well, it will facilitate the emergence of support and commitment from many parties for the project.
5. The involvement of many stakeholders can ensure that solutions to overcome environmental problems follow policies, regulations, and local socio-economic realities.
6. DbyP can provide collaboration, knowledge sharing, and collective action that encourage building resilient communities.
7. The benefits for students are authentic learning experiences, opportunities to provide services to the community, and the ability to develop a future vision and narrative about their community and environment.

In conclusion, the DbyP method offers a comprehensive and inclusive approach to addressing environmental problems and ensuring sustainable societal welfare. However, Montt-Blanchard said that there are differences in work settings and field dynamics that universities need to pay attention to if they want to apply it as a study and work method for students.

3.0 Methodology

The method used in this research is activity program evaluation. The study is qualitative; The assessment uses measuring tools taken from literature studies, consisting of the degree of initiative, participation, collaboration, creativity, and activity time management. Measurements are carried out during program implementation and after the program is completed. There are 2 types of data, namely primary data obtained through direct observation in the field, and secondary data obtained from activity implementation reports.

4.0 Findings

4.1 Experience and Lessons from Implementing DbyP

The following section presents three cases of community engagement carried out by the Interior Design Study Program from FSRD ISI Yogyakarta. Two cases are about tourism development programs and one case is about dealing with plastic waste. The three cases only involved a few students, 3 up to 5, and the time was not included in the faculty's academic calendar.

4.1.1 Case 1: Utilisation of Public Creative Space in Yogyakarta City

Fig. 1. (a) Public exhibition of Sayidan village; (b) Sayidan tourist village festival
(Source: Research Team, 2023)

Yogyakarta is a cultural tourism city and the center of Javanese culture. The Yogyakarta city government strives to maintain this character. One of the strategies is to provide public creative space facilities that accommodate interaction and expression of local culture in planned creative activity zones. Sayidan village was chosen as the pilot project for Tourism Village because it could be developed into a leading tourist destination in Yogyakarta. The expected impact is that this project can move the wheels of the local economy to increase community welfare.

In the program implementation stage, the ISI Yogyakarta Design Team collaborated with 3 others, including the local community. This village has many creative economic potentials, such as craft, architecture, performing, and culinary arts. The Design Team and LPMK re-identified and created a plan to develop tourist attractions in the village through the Sayidan Tourism Village Festival. Preparing the festival activity plan took a long time; negotiations were tough because public perception was still difficult to change. Moreover, there are other obstacles on the part of the community, such as the absence of *local champions*, which are the drivers of participation, the absence of 'important and urgent' needs, the lack of enthusiasm and willingness to build a tourist village, the inactivity of local youth organisations, and the limited funds available. However, considering that this program involves the interests of the Yogyakarta City Government, 'like it or not,' the activities must be carried out, even without full support from the community.

4.1.2 Case 2: Local Potential Development in Banaran Village, Kulon Progo, Yogyakarta

Fig. 2. (a) Kulon Progo potential festival; (b) Village tourism group
(Source: https://kulonprogokab.go.id/v31/detil/10018)

Banaran Kulon Progo Village has potential tourist attractions, such as nature, culture, cuisine, etc. This potential has not been managed optimally. This joint activity aims to create and promote tourist attractions in Banaran Village to increase the village's original income. The ISI Yogyakarta Design Team and local village officials tried to assist in developing activity concepts.

At the implementation stage, the ISI Yogyakarta Design Team, together with the government and village communities, experienced obstacles, especially in preparing the concept of tour packages and the set tourist rates. This problem arises because of the need for more knowledge and skills of village communities in cultural tourism. For example, locally made culinary products' packaging design and prices do not respond to people's tastes and purchasing power. Village communities tend to feel comfortable with their daily activities and lifestyle, so they face difficulties when they have to formulate the concept of "new activities" that must be presented. Village communities are also unused to making detailed, systematic plans with stakeholders. They tend to choose to implement programs that the regional government has planned. The positive thing they have is the enthusiasm and active involvement of the youth.

4.1.3 Case 3: Processing Yogyakarta City Waste into Creative Products

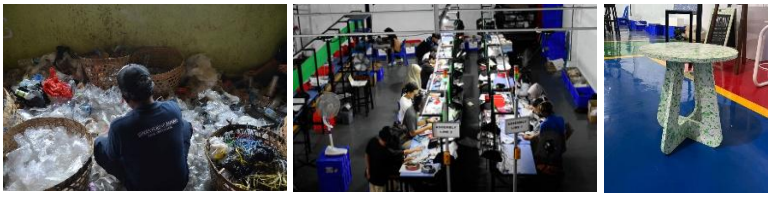


Fig. 3. (a) Plastic waste sorting; (b) Processing plastic waste into creative products; (c) Final prototype
(Source: Research Team, 2024)

The city of Yogyakarta experienced a drastic decline in the quality of its environment due to piles of rubbish; this gave rise to complaints and protests from the wider community. As the 10th regional head, Sri Sultan Hamengku Buwono called for collaborative work, namely

the regional government inviting educational institutions and DUDI to process waste into new products or *upcycling* innovative and competitive. There are three ways to reduce waste generation, namely by *reduce* (reduce), *recycle* (recycling), and *reuse (reuse).* The ISI Yogyakarta Design Team, together with the Yogyakarta City Trade Office through the MBKM Independent Study Program, conducted applied research processing non-organic waste at TPS3R Pasar Giwangan into interior furniture products to meet the needs for facilities and infrastructure in Rusunawa, Yogyakarta City.

The project began with collecting field data through surveys and interviews with some parties. Several obstacles are faced, namely that TPS3R Pasar Giwangan is limited in sorting and has not carried out the recycling process for finished products because they do not yet have the experts or workforce to process non-organic waste. Meanwhile, the Surolaras Waste Bank has tried to recycle plastic waste into finished products. However, due to a lack of knowledge about design and marketing strategies, the products produced cannot meet market tastes and sales targets. Based on these two obstacles, the ISI Yogyakarta Design Team invited PT. Synthetic Inamas Technology for synergy *knowledge sharing* and finding solutions to overcome existing problems in the plastic waste recycling process. Meanwhile, in the studio, the design team conducted a design analysis. It explored using repurposed green materials for furniture in Rusunnawa, and alternative designs were then submitted to DUDI to make a prototype.

5.0 Discussion

The lesson learnt from those cases is that complex societal problems, such as waste management in Yogyakarta or developing tourist villages, require time, collaboration, and a holistic approach. Community mobilisation figures play a vital role, and intensive interaction with residents is essential to understand their needs and context. Academics and students should act as facilitators who empathise with residents, accommodate input, and foster a sense of ownership. Effective programs need extensive outreach to raise awareness and participation, encouraging creativity and innovation. Academics, particularly in arts and design, can provide vital support by imparting knowledge and skills. Successful development of tourist villages or waste management solutions requires synergy among government, academia, private sectors, and the community, Penta helix, emphasising the need for collective commitment and cooperation. This is crucial for implementing sustainable practices like emphasis, recycling, and reuse. This united effort can enhance local economic welfare and provide long-term solutions to societal challenges.

These cases show that the activity program involves collaboration with external parties, especially the Regional Government (PEMDA), as the main initiator. Academic involvement is usually limited due to time not aligning with the academic calendar, minimal funding allocation, and focus on supporting social activities. Although collaborative, these programs are small-scale and may not have a wide impact but are beneficial to local communities. Educational institutions typically contribute more intellectual input, reflecting a pattern of leveraging expertise to achieve social goals with limited resources. The DbyP approach used in this activity involves various stakeholders in creating solutions, especially social and environmental problems, by empowering communities to actively participate in the development process. This method ensures that the solutions provided are relevant, sustainable, and tailored to local needs. DbyP is critical in the current context, addressing major challenges such as climate change, social inequality, and sustainable development, thereby enabling society to build a prosperous and environmentally friendly future.

This discussion implies that DbyP is good and can be implemented by design students at universities with several settings. Namely the details of time, number of students participating in each activity program, interactions and reciprocal relationships between stakeholders, as well as a balanced distribution of financing between the parties involved.

6.0 Conclusion and Recommendations

The DbyP approach can be an option for how to overcome environmental problems. The DbyP approach can be utilised by design students when studying and working with the community to gain authentic learning experiences with the living environment and its community of residents. This benefit is in line with UNESCO's goal of green education, namely so that in the future, generation Z can act responsibly in the green transition towards a prosperous, environmentally friendly, and sustainable society. However, implementing programs that apply the DbyP approach or *community engagement* still faces several obstacles, such as implementation governance cooperation between parties. Therefore, the following are several recommendations for implementing DbyP to be carried out more effectively by higher education design institutions.

In general, the study carried out this time has been able to conclude that activity programs using the DbyP method provide many benefits for the community, students, universities, and other stakeholders. However, this study is still limited to qualitative measurements, therefore future research needs to be carried out more measurably and quantitatively.

Future research is to examine in more detail how to integrate DbyP-based activity programs into the design education curriculum, such as determining the number of courses that can accommodate the application of DbyP and the number of project-based classes, compared to the total number of courses. Furthermore, educational institutions must prepare regulatory mechanisms and technical SOPs for implementing the Teaching and Learning Process, requirements for student participation in projects, including grade conversion schemes, and determining the schedule for DbyP project activities. Then it is also necessary to develop networks with work partners such as NGOs, local governments, small industries (MSMEs), and socio-cultural communities.

Acknowledgements

This study is fully funded by the Faculty of Visual Arts, Institut Seni Indonesia Yogyakarta.

Paper Contribution to Related Field of Study

The paper finds the DbyP methodology significant and crucial to incorporation in design education.

References

Husic, D. W. (2024). Reframing sustainability initiatives in higher education. *Sustainable Earth Reviews*, *7*(1). https://doi.org/10.1186/s42055-024-00076-9

Lee, Y. (2007). What are the social responsibilities of designers? Investigating new perspectives for design participation. *Iasdr07*, 1–17.

Meroni, A., & Fassi, D. (2013). Design for social innovation as a form of designing activism. An action format. *Nesta*, *June 2014*, 1–15.

Montt-Blanchard, D., Najmi, S., & Spinillo, C. G. (2023). Considerations for Community Engagement in Design Education. *She Ji*, *9*(2), 234–263. https://doi.org/10.1016/j.sheji.2023.05.004

Sanders, E. B., Stappers, P. J., & Ave, O. P. (2008). Preprint Draft. *CoDesign*, *4*(March), 1–16. http://journalsonline.tandf.co.uk

Schleicher, Andreas, *Empowering youth for a greener future: the significance of education and training*, OECD Director of Education and Skills, January 2024. https://www.unesco.org/sdg4education2030/en/articles/empowering-youth-greener-future-significance-education-and-training

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft, and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organized by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Inclusiveness of Social Environment Village as Part of Yogyakarta's Integrated Elderly Service Program

Danang Febriyantoko*, **Muhammad Fikri Hanafi**

**Corresponding Author*

Interior Design Program, Institut Seni Indonesia Yogyakarta, Yogyakarta, Indonesia

danang.febriyantoko@isi.ac.id
Tel: +6285878223344

Abstract

Indonesia will become one of the countries aging demographically, and the percentage of people over 65 will continue to increase yearly. A development issue that needs to be considered before Indonesia enters the demographic bonus era in 2030 is the aging of its population. Yogyakarta is known as a province with an elderly population higher than the national average. The Yogyakarta City Government has an integrated elderly services program at the sub-district level to create an elderly-friendly city. This research seeks to provide design innovation through an inclusive design approach analyzing the spatial patterns of elderly-friendly villages.

Keywords: Design; elderly; friendly; village

eISSN: 2398-4287 © 2024. The Authors. E-International Publishing House, Ltd., UK, publishes them for AMER and CE-Bs. This is an open-access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer review is under the responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and CE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6156

1.0 Introduction

The explosion of the elderly population is a global phenomenon that occurs in developed and developing countries, including Indonesia. Elderly-friendly social policies are essential amidst the increasing number of older people. The right to life, as well as protection and policies related to the welfare of older people in Indonesia, have been regulated in Law (UU) Number 13 of 1998 on the Welfare of the Elderly. However, it has a legal basis regarding older people; it is vital to have a sustainable and strategic roadmap to support the welfare of older people in Indonesia. Yogyakarta has elderly resources that are above the population average at the national level; the increasing life expectancy partly influences this in Yogyakarta (Suriastini.,et al., 2013). The increase in life expectancy in Yogyakarta is influenced by the sociological conditions of society that support older people to be active; the empowerment of village areas as a place for residents to live affects the quality of older people in them. The Yogyakarta city government is preparing a regional action plan for the welfare of older people from 2023-2026. The policy direction is to create an elderly-friendly city and launch the Integrated Elderly Services (IES) program in Wirogunan sub-districts as a pilot project (Portal Berita Pemerintah Kota Yogyakarta, 2023). Subdistricts were selected as a pilot project not only based on the elderly population but also on consideration of the region's readiness to implement the program.

eISSN: 2398-4287 © 2024. The Authors. E-International Publishing House, Ltd., UK, publishes them for AMER and CE-Bs. This is an open-access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under the responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers) and CE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6156

Creating senior-friendly social policies means supporting inclusivity and making the "Leave No One Behind" principle happen. All stakeholders and policymakers must strengthen cooperation in formulating policies and take steps related to handling older people, starting from the village of a minor level of scale. To make the city of Yogyakarta an elderly-friendly city, parameters needed to be adopted from WHO: (1) Open space available, (2) Elderly friendly transportation, (3) Home worthy of the elderly, (4) Social participation, (5) Friendly employment for the elderly, (6) Respect for inclusion, (7) Communication and information, and (8) Health Services (J. van Hoof, H.R. Marston, J.K. Kazak, T. Buffel, 2021). Since the proclamation of seniority declared at the grand senior meeting in Madrid in 2002, attended by 157 countries, including Indonesia, known as MIPAA 2002,[1]By seeing the change in the aging paradigm from the construction of the orphanage in 1982 to active seniors, the 2002 MIPAA Declaration consists of 3 pillars, namely: (1) participation of the elderly population in state development, (2) improving the quality of services health and social (at the primary level), and (3) an environment that supports older people or known with the term active aging (Yogyakarta city roadmap to become an elderly friendly city, 2019).

This research will investigate implementation of the Integrated Elderly Services program by take case studies in Wirogunan district as a pilot project, specifically in Bintaran village. The study will analyze the quality of the living environment for senior citizens based on the parameters adopted by the World Health Organization (WHO). This research has boundaries by a study of the design of the built environment that can accommodate the needs of older people in accessing services from the government. The data collection method in this study is surveys and interviews conducted with stakeholders of senior empowerment at the level of maturity related to the implementation of the Integrated Elderly Services program. Analysis of the gathered data followed. descriptively on the needs of each dimension associated with the conditions of the village environment. As a pilot project for implementing the Integrated Elderly Services program, the Wirogunan sub-district must appraised simultaneously to create an elderly-friendly village environment. This study will identify the condition of the village environment based on the parameters of an elderly-friendly city area determined by WHO.

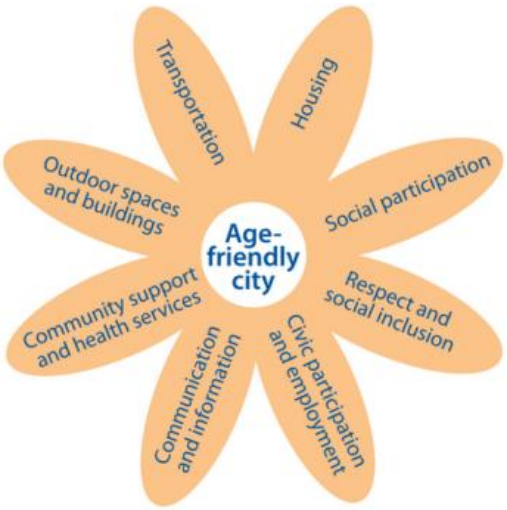


Fig. 1: Model of Age-Friendly Cities
Source: (World Health Organization , 2007)

One indicator of an area that is friendly to older people is the availability of public space that is safe and comfortable for the elderly; this research seeks to examine further the setting area of an elderly-friendly village, which has become a pilot project for implementing the IES program. Habit, as well as the character of older people, become the object of research by mapping the condition of older people and providing suggestions for designing public spaces that are safe and comfortable for activities in the village environment. Even though it seems to be preparing a public space design that is safe and comfortable for older people, this research is also an effort to prepare our future "home" to become elderly.

2.0 Literature Review

The elderly, pregnant women and children are three vulnerable groups that are typically found in society. Functional consequence theory states that the elderly experience changes related to age and an increased risk of various diseases (Miller, C.A., 2012). Three main factors that cause the elderly to be included in the vulnerable group are that they are no longer economically productive, have health problems, and need a companion as a caregiver (Bloo,, DE, E. Jimenez, L. Rosenberg, 2011). Review from the structure Indonesia's

[1] MIPAA 2002 (Madrid International Plan and Action on Aging) marks a turning point in the world's challenge of "building a society for all ages," offering a new agenda and action plan to address population aging in the 21st century.

population is currently transitioning towards a stable population structure aging; an area asserted to have an old population structure when the percentage of older adults in the region reaches 10 percent or more (Cicih, Lilis Heri, Darojad Nurjono Agung Nugroho, 2021). Policies for handling elderly problems need to consider diversity and the unique needs of each community group, especially in Yogyakarta, which has a different social character, where each household has a relationship high social kinship in the practice of caring for older people (Keasberry, Iris, 2002). Studying elderly-friendly villages as a resilient city approach in supporting the achievement of Sustainable Development Goals (SDGs), Elderly-friendly villages are necessary as one of the steps in achieving the eleventh Sustainable Development Goal, namely creating inclusive and resilient cities.

3.0 Methodology

This study will use a sample in the sub-districts that have been appointed by the Yogyakarta city government as a pilot project for the implementation of the Integrated Elderly Services program, Bintaran Village was chosen as a case study considering that this village is the first pilot project in 2022 selected by the Yogyakarta city government in implementing an integrated elderly service program. This village was chosen as the first pilot project not only because of the large elderly population but also the local capacity to care for and empower the elderly in their community. The design approach in this research for the elderly is inclusive design. Inclusive design aims to eliminate barriers that burden and limit users. Inclusive design helps all users to participate in equality and freedom in everyday activities (Fletcher, 2006). Inclusive design has five basic principles. First, places people at the heart of the design process. Second, acknowledges diversity and difference. Third, offers choice where a single design solution cannot accommodate all users. Fourth, provides for flexibility in use. Fifth, provides buildings and environments that are convenient and enjoyable to use for everyone. The methods will later produce design criteria. From these criteria, design concepts can be drawn.

4.0 Findings

Unlike other elderly-friendly villages in Yogyakarta, the elderly-friendly village in Wirogunan focuses on handling older people. In the Wirogunan sub-district, they have their community that works as volunteers. They divide older people in their area into three classifications:

Table 1. Classification of Elderly

Elderly Classification	Description
Class 1	Elderly who are still able to carry out activities in general, just like those of productive age in general
Class 2	Elderly who have physical limitations but can still do activities
Class 3	Older people require a partner for every action because they are generally constrained.

(Source: Author, 2024)

Fig. 2. Environmental Conditions of Bintaran Village
(Source: Author, 2024)

Currently, Bintaran Vilages focuses on class 3 older adults, many of whom cannot walk and need help when sick. Even within one week, they evacuated class III older adults up to 7 people, and the evacuation was carried out purely from the hearts of the community without any reward. Bintaran village has a dense area with little public space and narrow road access. The density in Bintaran village

affects not only the elderly but also the children who live and reside there. Also, they need a place to play; even to carry out community activities, they use narrow roads and alleys by laying out mats to gather. The condition of the village hall as the center of community activities, which is directly opposite the narrow road access, reduces the conduciveness of residents to carry out activities there, such as exchanging opinions, formulating problems, and gathering together to discuss programs that shall proceed in this village. The Integrated Elderly Service Program was established and put into action according to the main priorities needed by the residents there; most of the problems that occurred with older people in this village were the difficulty of access when they had to evacuate a class III older person who needed help, with narrow alley conditions and uphill roads, even ambulances did not have access to enter the Bintaran village area. Maintaining consistency in this social activity presents an additional hurdle for the residents.

Table 2. Analysis of Bintaran Elderly Friendly Village

Parameters Age-Friendly City	Description	Principles Inclusive Design
1. Outdoor Space and Buildings	The condition of the Bintaran village area is in the middle of the city. The population density in this village causes a lack of open facilities specifically for the elderly. Still, one area is used as a gathering place for residents, and some active elderly people are only used for conversation.	Provide building and environmnets that are convenient and enjoyable to use for everyone
2. Transportation	Bintaran village has narrow alleys, and the distance to do activities around the village can be said to be close to the gathering center; most of them usually walk to the location because the distance is near. However, public transportation is very far from their area; if they need public transportation, such as city buses, they must travel a long distance from their location to the waiting point. Usually, they rely on pick-up and drop-off using motorbikes by children or relatives, and productive older adults still usually ride their motorbikes and bicycles.	Acknowledges diversity and difference
3. Housing	The standard of eligibility and comfort of the residences owned by most older adults in this village can be considered far from comfortable. Even the condition of the bedrooms can be imagined how their conditions are there. Many factors influence the condition of their houses, including economic factors.	Provides for flexibility in use
4. Civic Participation and Employment	The village community consists of older adults who work voluntarily and consciously; as village assets, older people have a role in protecting and maintaining the village environment.	Places people at the heart of the design process
5. Respect Social Inclution	To prevent the perception of an age divide there, this village also has a Peer Support Program, which trains young people to improve their education in facing old age and increase their sympathy and empathy for older people around them. They even have a community formed on their initiative, the Integrated Elderly Institution, which has an empowerment program for older people in Bintaran village and even in the Sub-districts.	Places people at the heart of the design process
6. Social Participation	An activity that has a significant role for older people is during Indonesia's Independence Day celebration. In several series of events that they have, there is one exciting event here, namely holding a gathering at night in one of the alleys in the village and then presenting an elderly figure in this village to tell stories about anything that can be a lesson for the young people there, even those who attend the event.	Places people at the heart of the design process
7. Comunication and Information	Village information spreads through the village notice board media in the village hall. In addition, announcements are frequently supplied using loudspeakers located in the mosque. However, using gadget telecommunications technology is common for the people of Bintaran village.	Choice where a single design solution cannot accommodate all users

8. Community Suport and Helath Services	Bintaran village has a health service that collaborates with one of the health centers in Yogyakarta. Still, the health workers at the following health center have a specific time to check the health of older people in this village once a month. However, if there is an emergency, they can usually be there to help with the needs of older people in Bintaran village.	Places people at the heart of the design process

(Source: Author, 2024)

Character Bintaran village : has narrow and step alleys is main problem especially for evacuating elderly who need help an ambulance to be able access this village. Another problem is lack of public open space that can be used by community for communal activity. Existence of quality public spaces for elderly is also one of parameters for realizing an elderly-friendly city. The capacity of the Bintaran village community is quite good in treating the elderly, residents have an awareness to help each other in dealing with elderly problems in their area, the younger generation cares enough about the elderly so that they voluntarily help care for class III elderly at home with the help of health workers. Bintaran Village also has an elderly-friendly community program including: BPJS (Self-Help Corpse Embalming Assistance) in the form of assistance or compensation for elderly families who swear, in addition there is also a Peer Support program in the form of training for the younger generation to prepare for old age and increase empathy for the elderly. In addition there is also an elderly school which is a non-formal education to provide information, training on health, religion, social and culture so that the elderly can live happily and prosperously.

5.0 Discussion

Bintaran Village is known as a heritage village because it has ancient buildings in it with an Indies or colonial style, apart from its status as a heritage village, Bintaran Village also has the potential for problems related to handling the elderly in the city of Yogyakarta. Bintaran Village is the first pilot project for the implementation of the Integrated Elderly Service program initiated by the Yogyakarta city government, the selection of Bintaran Village as the first pilot project is not only based on the large number of elderly people living there but also the capacity of the community in caring for and empowering the elderly in their daily activities. There is one empty land of a former building/house of a resident that is now abandoned and no longer used, becoming the object of design in this study. The lack of open land and the lack of health facilities and road access for evacuating the elderly are the focus of solving the problem. Based on the results of observations and interviews with the Bintaran Village manager, the village residents need a community activity center that can accommodate community meeting activities at certain events. The involvement of all elements of society from young to old contributes to the development of the village area.

6.0 Conclusion and Recommendations

Fig. 3. Recommendation Design of Bintaran Elderly Friendly Village
(Source: Author, 2024)

In general, the condition of Bintaran Village has yet to be friendly to older people, especially in terms of environmental quality. Several factors that cause ecological conditions that need to be more friendly to older people include the village's location in a densely populated area in Yogyakarta. In addition, the need for more elderly-friendly public facilities makes this area yet to be friendly to older people. However, the social conditions of the Bintaran Village community are good in supporting an elderly-friendly area. Senior citizens are

accepted in the community and are encouraged to participate in village development. This human resource potential can be the basis for compiling a village action plan that is more friendly to older people. The path to realizing Yogyakarta as an elderly-friendly city is quite focused, and careful planning for elderly-friendly public facilities is needed. From the results of this study, it is possible to submit several recommendations, one of which is the need for a green open space management program in the Bintaran village environment. This can be a more environmentally friendly solution by involving all elements of society, from the young to the elderly, working together to create elderly-friendly public facilities.

Acknowledgment

We want to thank the head of Bintaran village for the permission and opportunity to visit and observe the community's activities and the elderly who continue to work voluntarily to build the town. We would also like to express our gratitude to ISI Yogyakarta, an art education institution that cares about sustainability.

Paper Contribution to Related Field of Study

This paper evaluates the elderly-friendly city program currently being run by the Yogyakarta government. From this paper, we can learn to continue improving actions to create a more elderly-friendly region globally.

References

Bloo,, DE, E. Jimenez, L. Rosenberg. (2011). *Social Protection of Older People*. Boston: Program on the Global Demography of Aging.

Burton, E., & Mitchell, L. (2006). *Inclusive Urban Design: Streets For Life (1st ed.).* London: Routledge. https://doi.org/10.4324/9780080456454.

Cicih, Lilis Heri, Darojad Nurjono Agung Nugroho. (2021). Kondisi Lanjut Usia di Indonesia Era Bonus Demografi. *Jurnal Kependudukan Indonesia Vol 17 No 1*, 1-14.

Fletcher, H. (2006). *The principles of inclusive design (They include you)*. Retrieved from www.cabe.org.uk: https://www.designcouncil.org.uk/fileadmin/uploads/dc/Documents/the-principles-of-inclusive-design.pdf

J. van Hoof, H.R. Marston, J.K. Kazak, T. Buffel. (2021). Ten questions concerning age-friendly cities and communities and the built environment. *Building and Environment, Vol 199*, 1-26.

Keasberry, Iris. (2002). *Elder Care, Old Age Security and Social Change in Rural Yogyakarta.* Thesis Wageningen University.

Miller, C.A. (2012). *Nursing For Wellness in Older Adults 6th Edition.* Cleveland: Ohio.

Portal Berita Pemerintah Kota Yogyakarta. (2023, September 11). Retrieved July 16, 2024, from warta.jogjakota.go.id: https://warta.jogjakota.go.id/detail/index/29069

Suriastini.,et al. (2013). *Satu Langkah Menuju Impian Lanjut Usia; Yogyakarta Kota Ramah Lansia 2030.* Yogyakarta: SUrveyMETER.

World Health Organization . (2007). *Global Age-Friendly Cities: A Guide*.

World Health Organization. (2015). *Measuring the Age-Friendliness of Cities: A Guide to Using Core Indicators.* Kobe, Japan: WHO Library Cataloguing.

Yogyakarta city roadmap to become an elderly friendly city. (2019). *Yogyakarta city roadmap to become an elderly friendly city.* Yogyakarta: Yogyakarta Mayor's Policy Number 450.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta
https://arcadesa.isi.ac.id/index.html
8th Art, Craft and Design in Southeast Asia International Symposium
ISI Yogyakarta Indonesia, 27-28 September 2024
Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Wu Guanzhong's Colored Ink Landscapes: An exploration of the healing and environmental protection function of the double swallows

Zhang Ziyi, Mohd Fuad Md Arif*, Wang Yunlong, Zhao Shanshan
**Corresponding author*

College of Creative Arts,
Universiti Teknologi Mara, Shah Alam, 42300, Malaysia

2022862092@student.uitm.edu.my, fuad5649@uitm.edu.my, wangyunlong2022@gmail.com, 2022240576@student.uitm.edu.my
Tel: 1st +60 142645168

Abstract
In contemporary society, as people pay increasing attention to environmental protection, the environmental protection function of art has also garnered more focus. This paper will explore the healing and environmental protection functions of art. By analyzing the aesthetic elements and cultural significance of Wu Guanzhong's "Double Swallows," we aim to elucidate how Wu Guanzhong's colored ink landscape paintings fulfill their artistic healing role and enhance environmental awareness.

Keywords: Wu Guanzhong, color ink painting, art healing, environmental protection

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6158

1.0 Introduction

The formation and origin of Chinese landscape painting can be traced back to people's deep love for the natural environment on which they depend. It reflects the relationship between man and nature, blending the two perfectly into a harmonious whole. Wu Guanzhong once said, "I have been painting Jiangnan off and on all my life." Among the many works on the subject of Jiangnan, and even among all my works, I think "Double Swallows" is the most prominent and representative. Double Swallows Fly Up, Nostalgia Unbroken. His works reflect his unique artistic method and deep concern for his hometown and environment. This paper aims to discuss the healing function of Wu Guanzhong's colored ink landscape paintings and the environmental protection function through the iconographic analysis of his work "Double Swallows".

2.0 Literature Review

Art healing originated in the West and is a new discipline that emerged in Europe and the United States after World War II to achieve the ultimate healing purpose through the interdisciplinary psychology of art, psychology, and medicine. The healing effect of art is divided

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6158

into two aspects from the audience's point of view: 1) the viewer's healing during the appreciation of artworks and 2) the creator's healing of himself during the creation process.

Art healing, particularly in the form of painting healing, is an important branch of expressive arts healing that promotes individual mental health and emotional expression through painting. From a psychological perspective, Freud and Jung believed that artistic creation can reveal the contents of the unconscious mind. Jung especially emphasized the value of exploring symbols and archetypes in the collective unconscious through artwork, viewing it as a way to connect individuals with their deeper inner selves. From a humanistic viewpoint, psychologists such as Carl Rogers considered creative expression as a means of self-actualization. In cognitive behavioral therapy (CBT), painting healing aids individuals in recognizing and adjusting negative thought patterns that lead to emotional distress and maladaptive behaviors through the reflective and interpretive processes involved in art creation.

The healing effect of art is conveyed through different mediums in the creation of the creator, and in the process of appreciating the work, the viewer can play a healing role by empathizing with the work. People can resolve their inner conflicts, reduce stress, promote self-awareness, and treat mental illnesses through art creation and appreciation.

3.0 Methodology

This paper analyzes the theory of Iconography concerning Panofsky. Panofsky divides the analysis of artistic meaning into three stages: pre-iconographic description, Iconographic analysis, and Iconographic interpretation.

In Studies in Iconography, Panofsky details his ideas about the three levels of art historical understanding:
Primary or natural themes: the most basic level of understanding, which consists of perceiving the work in its pure form. Secondary or traditional themes: this stratum goes further and brings cultural and iconographic knowledge. Tertiary or intrinsic meaning or content considers personal, technical, and cultural history when understanding the work. It does not view art as an isolated event but as a product of a historical context. In essence, the last level is a synthesis. The art historian asks, "What does it all mean?".

This paper focuses on the second level. Through an in-depth analysis of the colors, lines, and symbolism of the paintings, it illuminates the healing function of art in his work and stimulates the viewer's awareness of environmental protection.

Because Erwin Panofsky emphasized the content, inner meaning, symbols, and themes of the visual arts in international journals (Panofsky, 1955), this paper uses a qualitative approach based on the concept of interpretive research. Interpretive research emphasizes the process of textual interpretation, focusing on how participants' narratives are understood. It seeks to explore the underlying meanings and how participants construct their social reality through language.

4.0 Findings

4.1 The First Level: Pre-Iconographical Description

This artwork is titled "Double Swallows" and was created in 1988 by Wu Guanzhong. Using ink as the foundation on paper, the artist added green, yellow, red, and other to depict the scene. Throughout the composition, there are houses with black tiles and white walls typical of the Jiangnan region, composed of simple lines and gray-black blocks. The left side of the picture is left blank, with a well-arranged mix of black and white blocks. In the center of the painting stands a tall tree with gracefully extending branches, and a tall, long white wall occupies about two-fifths of the composition. Below the wall is a serene lake with a misty reflection. In the sky above, two agile swallows are depicted in flight.

Figure 1. "Double Swallows" 69cm×137cm 1988

4.2 The Second Level: Iconographical Analysis

The image depicts typical Jiangnan-style buildings, calm waters, and Jiangnan architecture. A plain wall lying in one-third of the plane of "Double Swallows" is the main body of the painting, and the white space of the main body reflects another kind of quietness and seclusion.

The composition of "Double Swallows" appears deceptively simple, bearing a striking resemblance to the numerous "Water Village"

(水乡)artworks he created in the 1980s. Spanning the entire canvas are the black-tiled, white-walled houses typical of the Jiangnan region, composed of clean lines and black-gray blocks. The composition leaves ample white space, with a calm lake surface under the wall, creating a serene reflection that complements the dignified and clean nature of the white walls. This painting focuses on plane segmentation and geometric combinations. The narrow, elongated black doorways on the horizontal white wall present a distinct contrast, emphasizing the white wall's solemn, pristine, and elegant qualities.

E. Spranger categorized human life into six types: theoretical, economic, social, political, artistic, and religious. Wu Guanzhong, on the other hand, mainly belongs to the artistic type. According to Freud's theory, "Sublimation is the psychological process of transforming the primitive impulses of the ego into complex actions through the ego." In the challenging times when he could not realize his ideal, Wu Guanzhong turned his attention to the natural landscape. He sublimated his artistic style and philosophy by depicting landscapes and sublimating them into an inner experience. Through artistic creation, he realized the inheritance of his artistic philosophy and spiritual heritage. Wu Guanzhong integrates landscape elements into his artistic creations, expressing his deep yearning for the unique beauty of the Jiangnan water towns.

Several narrow and slender black doors are skillfully arranged to add rhythm to the composition. The square gives a very open, heavy, and stable feeling. In this serene image, one finds a pair of swallows in agile flight, disturbing the peaceful and ancient atmosphere. This introduces a hint of freshness and vibrant energy that sweeps away the lively atmosphere. The painting "Two Swallows" depicts the scenery of the Jiangnan water town with simple but uniquely rhythmic lines. By highly summarizing the picture's composition, the artist presents Jiangnan's unique, ancient, and fresh flavor. The calm river water, the old white wall, and an ancient tree form a simple and powerful visual focus, conveying a sense of peace and tranquility to the viewer.

The tree is depicted using traditional Chinese painting techniques, with lines depicting delicate branches reminiscent of the elegant gestures of women in southern China. This energizes the composition. In art therapy, trees often bridge nature and personal emotions.

Humans have recognized a special connection with trees since ancient times. Every major religion included trees in their earliest stories. The Egyptians had their sacred groves, and the Bible mentions trees at least 120 times. The Celts saw the magical power of different kinds of trees. Philosophers such as Rousseau and Thoreau claimed that engaging with trees and the outdoors could bring moral values or goodness. J. Sterling Morton, the founder of Tree Day, agreed, saying, "Children reared among trees and flowers growing up with them will be better in mind and heart than children reared among hogs and cattle."

Denise Mitten succinctly listed the psychological-emotional values of spending time in nature (of which trees are a significant component): Mental restoration, Stress reduction and its impacts, Attention restoration, Improved mood states, Reduction of depression, Reduction of anger and anxiety, Enhanced feelings of pleasure, Increased mental acuity, Reduced mental fatigue, Improved problem solving-ability, Improved concentration, Improved body image for women, Increased feelings of empowerment, Encouragement of nurturing characteristics, Decreased risk of seasonal affective disorder (SAD), Mitigation of the impact of dementia.
Thus, viewers may experience emotional healing and a sense of oneness with nature by appreciating the trees in the paintings, which may increase their desire to protect the environment.

Figure 2. "Double Swallows"(local)

In this painting, the distinction between water and sky seems challenging. The only differentiation is the reflection in the water and the winged twin swallows soaring in the sky, which infuse vitality into the composition.

Figure 3. "Double Swallows"(local)

Swallows, as a symbol in traditional Chinese culture, carry profound meanings. In ancient China, swallows were considered symbols of auspiciousness, bringing good luck and positive news. In the poetry of the Tang Dynasty poet Cen Shen, a verse reads: "In September, the cold swallows arrive, and my heart is suddenly startled. (九月寒燕到，余心忽若惊)" This expresses the emotional impact and profound cultural connotations brought by swallows. Similarly, in this artwork, the paired swallows soaring in the upper left corner bring dynamism and brightness to the entire composition, disrupting its tranquility. The combination of movement and stillness highlights the tension in the artwork, imbued with poetic and artistic elements, radiating typical Chinese cultural significance.

The reflection is portrayed with curved gray lines, creating a hazy effect contrasting the calm water surface and clear water quality. This immersive technique allows the viewer to experience the tranquil ambiance of the Jiangnan water village. The soft qualities of the lines also convey a sense of serenity and comfort to the viewer and will emit a soothing feeling that will help to relieve the viewer's tension and anxiety. The concept of lines in art psychology is an age-old question. Poffenberger and Barrows organized an experimental study with a participation of 500 people, asking subjects to select lines from 18 types (Figure 5) that conveyed emotions such as "sadness," "serenity," "joy," and "anger." While there were differences in the subjects' responses to details, the majority tended to associate curves with a sense of "serenity" or "sadness."

Figure 4. "Double Swallows"(local)

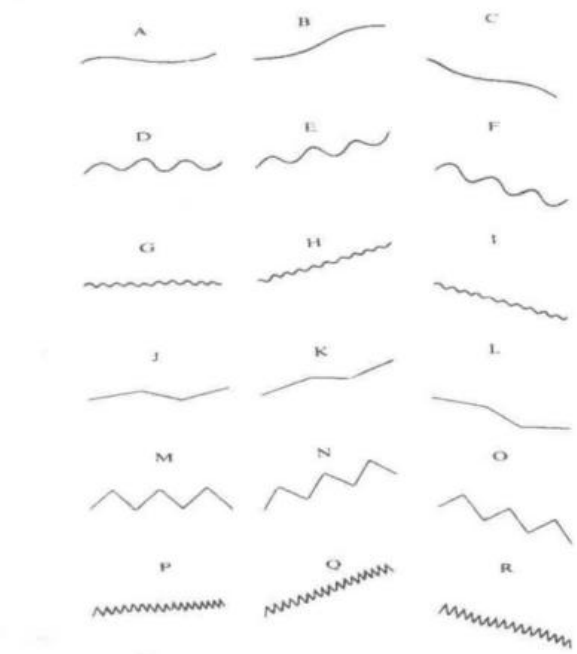


Figure 5

In front of the door, two or three dots of either red or blue, perhaps clothes drying, embellish the scene along with the yellow-green and Song-colored trees, adding a touch of playfulness to the picture. These lively colors also highlight the pristine white of the walls while simultaneously depicting the trees' exuberant and unrestrained growth. The color palette in the image is predominantly black, white, and gray, creating the typical tones of Jiangnan. According to psychological studies, people's attitudes toward colors involve four aspects: objective, physiological, associative, and personality. Colors can evoke pleasant emotional responses due to their purity, intensity, and richness. Conversely, unpleasant emotional responses arise from mixed, diluted, dull, or vague colors. The sporadic touches of vibrant red and blue in the image enhance its liveliness, although the overall atmosphere of Jiangnan residences is tranquil, with a hint of liveliness.

4.3 The Third Level: Iconological Interpretation

The West Lake often sketched Wu Guanzhong during his studies at the Hangzhou Academy of Fine Arts, and when he studied in Paris, he painted landscapes everywhere. In the 1950s, he painted Beijing's streets, alleys, temples, and pagodas in a rigorously realistic manner. Gradually, the scope of his sketching also extended to Wutai Mountain, Shaoxing, Jinggang Mountain, Ruijin, Hongtong, Hainan Island, and other places. Until the end of the 1950s, he ultimately gave up his original intention of "shocking the society with art," no longer depicted real people, and devoted himself to landscape painting, which could not serve politics. From then on, landscape painting became his life-long obsession.

In the 1960s, Wu Guanzhong kept running to Shaoxing. During middle school, he loved literature and especially admired Lu Xun, whose works influenced his life. The characters in Lu Xun's paintings were all familiar to Wu Guanzhong from his hometown, but since Wu Guanzhong's artistic outlook and stylistic pursuits could no longer be reflected in the characters, he was reminded of Lu Xun's The Hometown, which firmly established Wu Guanzhong's step from the bridge in his hometown in the South of the Yangtze River into the unknown stylistic world of his own.

Wu Guanzhong enthusiastically introduced several Western painters, with Maurice Utrillo standing out as a particularly great inspiration. Maurice Utrillo, an influential French landscape painter of the 19th century, left an indelible mark on Wu Guanzhong's artistic journey, primarily through his works portraying urban streetscapes during the "White Period."

The main body of Utrillo's work is richly layered in gray tones, with heavy blacks, elegant browns, and rich vermilion dotted throughout; the overall gray atmosphere creates a fantastic contrast. The tone of the artist's work is influenced by what happened to him in his life. He grew up as an illegitimate child, paralyzed by alcohol, and then, under the influence of his mother, the painter Suzanne Valladon, he began a new life by putting his feelings into painting.

However, unlike the pain and sadness he sometimes feels in real life, he expresses his love for the Montmartre region, with its bohemian solid atmosphere, in a poetic way in his creations. The rough brushstrokes give the noisy city a serene soul. Wu Guanzhong found a similar sentiment in the works of this landscape painter when he was studying in France. The strong contrast between black and white reminded him of the white-walled and black-tiled Jiangnan, the water towns haunted by nostalgia. In Wu Guanzhong's correspondence with Wu Dayu, he once wrote: "Since I stayed in Europe for a year and a half, I have tested myself and illuminated my own..... Today, my love and reverence for modern art have been shaken. I do not want to spend my life choosing a flower's career.....a year and a half; I know that this society, this crowd, and I do not relate to those who live and shine in the face of the I am very isolated. The wild dance of the lights is too rusty for me. My heart is living in a vacuum.....I do not want to work alone and the people who live together indifferently.....The study of art is not in Europe, not in Paris, not in the master's studio, in the motherland, in the hometown, in the homeland, in their hearts. "

Wu Guanzhong once said: I have been painting Jiangnan all my life. Among the many works based on Jiangnan, or even among all my works, the most prominent and representative is Double Swallows. Although the two swallows have flown away, nostalgia still exists.

5.0 Discussion

This study demonstrates that by analyzing Wu Guanzhong's painting "Double Swallows" through the principles of Panofsky's iconology, it reflects a profound art therapy function, and on this basis, can resonate with the viewer and trigger the viewer's desire to protect the environment.

Wu Guanzhong's ink and color paintings primarily focus on the landscapes and architecture of Jiangnan. The dynamic composition and vibrant colors in his paintings allow viewers to appreciate the beauty of nature. In this particular work, the addition of the symbol of swallows, representing the harmony between heaven and humanity, not only enhances the sense of tranquility and harmony in the painting but also underscores the necessity of ecological conservation and strengthens the emotional impact of the artwork.

6.0 Conclusion& Recommendations

"Double Swallows" demonstrates a powerful artistic healing function for the viewer through the analysis of composition, colors, lines, and elements. The composition is simple yet rich in connotation, and the interweaving of colors and lines creates an atmosphere of harmony and serenity. For Wu Guanzhong, the healing function of "Double Swallows" is mainly reflected in his attachment to the water towns south of the Yangtze River and the solace they provide against external pressures. For the viewer, the work evokes emotional resonance, brings relaxation, calmness, and contemplation, and creates a desire to protect nature.

This paper has limitations in terms of literature and information. Although the author has collected as much relevant literature and information as possible, some sources may have been overlooked or missed, which could affect the comprehensiveness of the research. Additionally, since this study is an interpretive qualitative research, the results carry a degree of subjectivity.

Paper Contribution to Related Field of Study

In the traditional academic discourse, the discussion of Wu Guanzhong's color ink landscape paintings mainly focuses on the decorative nature of his picture language, the development, and contemporaneity of color ink paintings, painting styles, techniques, etc. However, more research is needed from the perspectives of psychology and environmental protection, and this article provides a new perspective for the study of Wu Guanzhong's color ink landscape paintings.

References

Liu Fan,Tian Qinyuan,Zhang Du (2018). "Research on the Artistic Healing Function of Traditional Chinese Landscape Painting: A Case Study of Huang Gongwang's 'Dwelling in the Fuchun Mountains.'" Art Observation, (10), 114-117.

Wu Jiarui. Exploration of the Healing Functions of Art for Viewers and Creators [J]. Hebei Art Review, 2023(10): 169-171.

Nie Pan. The Healing Nature of Art — An Interview with Meng Peixin [J]. Art Observation, 2020(08): 8-10.

SUN Lin. Tracing the Semiotic Knowledge of Panofsky's Image Theory [J]. Journal of Beijing Film Academy, 2021(03): 12-22.

Lü Huabin (2019). "Wu Guanzhong's 'Double Swallows': Artistic Communication Beyond Imagination." Journal of Beijing Institute of Graphic Communication, 27(11): 48-51.

Chen Zhijian (2018). "Jiangdong or Jiangnan: Research and Reflection on the 'Jiangnan' of the Six Dynasties, Sui, and Tang Dynasties." Seeking Truth Journal, 45(02): 161-172.

Chen Xiangming (1996). "Evaluation of Qualitative Research Methods." Journal of Educational Research and Experiment, 1996(3).

Gao He (2018). "Analysis and Exploration of the Development and Temporality of Color Ink Painting." Today's Media, 26(11): 149-150.

Cheng Meixin, "The Artistic Differences between Wu Guanzhong and Xu Beihong—An Introduction to the Phenomenon of Modern Chinese Art History" (程美信《吴冠中与徐悲鸿的艺术分歧——兼谈中国现代美术史现象》), published in "Huakan" (《画刊》), March 2008.

Tian Wen(2020). "The relationship between traditional culture and art and ecological environmental protection in ethnic minority regions--A review of Ecological Protection and Traditional Culture in Ethnic Regions of China". Environmental Protection,2020,48(Z2):109-110.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Analysis of Environmental Characteristics in Suzhou-themed Landscape Paintings

Xu Yijiao, Sarena Abdullah*
**Corresponding Author*

School of the Arts,
Universiti Sains Malaysia, Penang, Malaysia

xuyijiao@student.usm.my, sarena.abdullah@usm.my
Tel: +60142730176

Abstract
Suzhou's picturesque landscapes have inspired numerous renowned artists to create artworks centred around this city. For instance, Fang Junbi (1898–1986) painted "Tiger Hill Pagoda in Suzhou" in the 1940s, while Wu Guanzhong (1919–2010) created "Suzhou Gardens" in the 1970s. These works showcase Suzhou's unique scenery, reflecting the artists' perspectives influenced by the environment. This study aims to analyse landscape oil paintings themed around Suzhou through the environmental lens proposed by Hippolyte Adolphe Taine (1828–1893) in his *The Philosophy of Art* (1873), summarising the characteristics of Suzhou's environment and highlighting the significance of Suzhou-themed landscape paintings.

Keywords: Suzhou; environment; landscape painting; the philosophy of art

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6159

1.0 Introduction

Artistic creativity is not only an expression of personal emotions and thoughts but can also profoundly reflect the characteristics of the environment in which the artist resides. Taking landscape oil paintings depicting Suzhou as an example, Suzhou has a subtropical monsoon maritime climate, characterised by mild and humid conditions, distinct seasons, and abundant rainfall. Known as the "Land of Fish and Rice" and the "Silk Capital," it is also praised as "Heaven on Earth"(*About Suzhou*, n.d.). Oil painting is an art form originating from the West that, when combined with the unique natural landscapes of Jiangnan, sparks new artistic inspiration, resulting in an artistic expression rich in regional characteristics.

For example, early 20th-century Chinese artists created a series of renowned Suzhou-themed landscape oil paintings by merging Western painting techniques with Suzhou's native scenery. These works vividly depict Suzhou's beautiful landscapes, elegant gardens, and tranquil natural environment, offering a fresh artistic perspective on this historic and culturally rich city, while advancing a deeper understanding and expression of environmental aesthetics.

The objective of this study is to explore the key role of environmental factors in artistic creation by analysing landscape oil paintings themed around Suzhou, revealing how Suzhou's unique natural environment influences the aesthetic qualities and artistic expression

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6159

of these works. Using the environmental perspective proposed in Hippolyte Adolphe Taine's *The Philosophy of Art* (1873), this study provides an in-depth analysis of a series of oil paintings depicting Suzhou. The research shows that environmental factors have a significant impact on artistic creation, as artists reflect Suzhou's unique environmental characteristics through their works. These paintings not only showcase the natural beauty and cultural essence of Suzhou but also offer a new perspective for understanding the interaction between environment and art. This study enriches the understanding of Suzhou landscape paintings and provides theoretical support and practical reference for artistic innovation through the environmental perspective.

2.0 Literature Review

In the creations of Chinese artists, Jiangnan landscapes often serve as an important source of inspiration. At the 5th "Picturesque Jiangnan—Chinese Oil Painting Exhibition" held in Suzhou, many artists showcased the natural scenery of Jiangnan through their oil paintings. Painter Qian Zhaofeng, using the sunset scenes of Suzhou's countryside as his subject, conveyed the tranquillity and beauty of Suzhou's environment. These works not only express the artists' insights into the natural environment but also reflect the profound influence of the environment on their creative style and themes. The president of the China Oil Painting Society, Xu Jiang, stated that, the exhibition represents an innovative way of merging artistic creation with regional culture by combining oil painting with Jiangnan themes. This statement highlighted the unique potential of oil painting in expressing local characteristics and the beauty of nature (*@Suzhou Ren, 213 Jian Huazuo Yao Nin Gong Shang Ruhua Xin Jiangnan! (@Suzhou Residents, 213 Paintings Invite You to Enjoy the Picturesque New Jiangnan Together!)*, 2023).

Regarding the relationship between art and the natural environment, contemporary scholars have proposed that the natural environment is not only a source of inspiration for artistic creation but also a key factor in shaping the style of an artist's works. As pointed out in the study "Evolution from Natural Aesthetics to Ecological Aesthetics in The Cases of Hegel, Taine And Leopold's Aesthetic Theories," nature plays an important role in aesthetic activities. Many literary works often depict natural scenes such as rivers, mountains, and landscapes, reflecting the influence of the natural environment on creators (Xu, 2015). In the field of art, the study "Research on Post-Impressionist Painting Based on Taine's 'Three-Factor' Theory" mentioned that environmental factors have also had a profound impact on artistic creation. For instance, during Van Gogh's time in Arles, in the south of France, he was inspired by the local sunlight, fields, and canal landscapes. His painting style became more emotional, with stronger colours and brushstrokes, reflecting the richness of the southern natural environment (He & Tian, 2020).

Tracing back to the 19th century, Taine, in his work *The Philosophy of Art* (1873), proposed that the overall characteristics of an artwork are determined by the artistic expression, mental state, and surrounding environment (Taine, 1873). He emphasised the inseparable relationship between art and environment, opposing the isolation of art from its social context. Taine demonstrated the multiple roles of the environment in artistic creation through various case studies, highlighting how artists coexist with their social environment (G. Morton, 2002). Therefore, Taine's perspective on the "environment" has become an important theoretical tool for analysing the environmental characteristics of artworks.

This study suggests that there is still ample research space regarding Suzhou-themed oil paintings. By incorporating the "environmental" factor from Taine's *The Philosophy of Art* (1873) into the analytical framework, a more comprehensive understanding can be gained of how these works reflect and respond to Suzhou's natural environment. It is important to emphasise that in Taine's theory, environmental factors primarily include two aspects: 1) the natural environment; and 2) the social environment (Liu, 2008). However, this paper focuses on the former, which is the natural environment, and delves into how the natural landscapes of the city influenced the artists when recreating these works. Suzhou's natural environment not only provided creative inspiration for the artists but also played a key role in shaping their artistic style and choice of themes. Through an analysis of Suzhou-themed oil paintings, this study aims to provide a more comprehensive understanding of the profound impact of the natural environment on artistic creation and reveal how these works embody Suzhou's unique natural features.

3.0 Methodology

In recent academic research, combining literature review methods with theoretical analysis has become the mainstream approach for exploring artists' creative concepts and practices, demonstrating the value of diverse methodologies in art research. This study focused on an in-depth analysis of oil paintings depicting the Suzhou environment to explore the environmental characteristics within these artworks. Compared to previous studies, this study combined archival research and data collection (Ventresca & Mohr, 2017), supplemented by the environmental factor influence from Taine's *The Philosophy of Art* (1873) (Taine, 1873), with the aim of capturing the deeper meanings of the artworks and the motivations behind their creation more comprehensively.

This study analysed oil paintings that were themed around the landscapes of Suzhou. The archival research and data collection methods were employed to identify the specific locations and environmental characteristics of buildings or landscape scenes depicted in the paintings. The analysis will also considered the artistic background of the creators to provide a more comprehensive understanding of the significance and value of these works. By applying the milieu factor from Taine's, *The Philosophy of Art* (1873), this study examined the environmental features within these oil paintings from a nuanced perspective. It is worth mentioning that this study selected artworks by renowned artists, all of which are oil paintings. Oil paintings offer excellent linear treatment and clarity, providing viewers with a strong visual impact, and making them particularly well-suited for exploring environmental characteristics (Alicja Zelazko, n.d.).

4.0 Findings

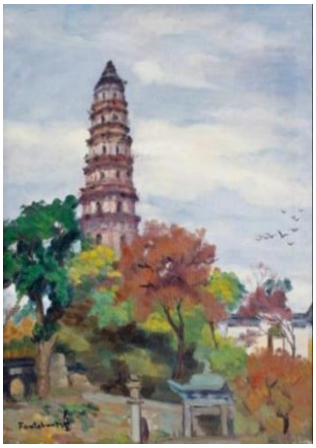


Fig. 1. Fang Junbi, Tiger Hill (pinyin: Suzhou Huqiu Ta), 1948, 74 cm × 60.5 cm, Oil on Canvas
(Source: Artron.Net (Tiger Hill (Hu Qiu), 1948))

The renowned early 20th-century artist Fang Junbi's landscape oil painting "Tiger Hill" (1948) (Fig. 1). recorded her travels in Suzhou. Due to the flat terrain of the Suzhou area, Tiger Hill has been a landmark of the city since ancient times. People have traditionally come here to visit flower markets, climb the hill, admire the moon, and enjoy the snow. Tiger Hill, known as "The First Mountain of Suzhou," is a historical landmark closely connected to the city's life (Zhang et al. 2023). The ancient pagoda in Fang Junbi's oil painting is located on Tiger Hill, commonly known as the Tiger Hill Pagoda. This pagoda stands prominently on the hilltop, making it a notable landmark.

The painting depicts an autumn scene with a clear, bright sky, where sparse white clouds drift leisurely across the pale blue expanse. The soft sunlight bathes the ancient pagoda, casting a warm glow over it. The autumn foliage displays a rich array of colours, with layers of red, yellow, orange, and green leaves surrounding the pagoda. The surrounding environment is peaceful and harmonious, with the yellowed grass and serene slopes looking particularly gentle under the autumn sun and a gentle breeze bringing a refreshing coolness. This natural setting makes "Tiger Hill" showcase a vivid and realistic depiction, which perfectly presents Suzhou's warm and elegant environmental characteristics that exude robust artistic beauty.

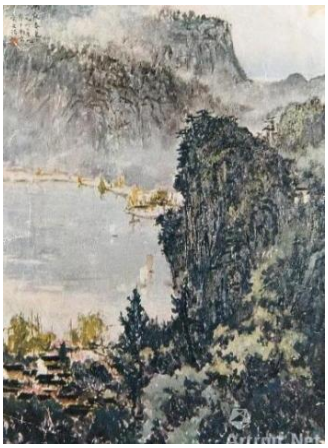


Fig. 2. Song Wenzhi, Spring Scenery of Dongting (pinyin: Dongting chunse), 1960, Size Unknown, Oil Painting
(Source: Artron.Net (Song, n.d.))

Song Wenzhi is known as a pioneer in the modernisation of Chinese painting. He devoted himself to studying Chinese painting and was skilled in creating majestic and profound landscape paintings (*Song Wenzhi-The Pioneer of Chinese Modern Painting Innovation_History and Culture*, 2021). Among Song Wenzhi's many landscape paintings, "Taihu Lake" is a typical artistic symbol of his work. Growing up in Jiangnan and continuing to live in this region where literati gathered, Song Wenzhi was deeply influenced by the Jiangnan sentiment. His paintings showcase Taihu Lake and Jiangnan's natural charm and delicate flavour (Guan Shan Yue Art Museum Researcher, n.d.).

The painting, "Spring Scenery of Dongting" (1960) (Fig. 2), was created by Song Wenzhi and is currently the earliest known work of his that used Jiangnan as its subject (Guan Shan Yue Art Museum Researcher, n.d.). The painting depicts Dongting of Taihu Lake in Suzhou, which is divided into eastern and western mountains. The area has a mild climate, abundant rainfall, and loose soil, making it an ideal place for tea tree cultivation with an excellent ecological environment (*Suzhou Taihu Dongting Shan Biluochun Zhizuo Jiyi (Suzhou Taihu Dongting Mountain Biluochun Production Techniques)*, n.d.). The work is depicted from a bird's-eye view of Taihu Lake,

showing the lake's clear waters surrounded by green trees, highlighting the picturesque scenery of Jiangnan. Although this is an oil painting, it is infused with the essence of Chinese painting, revealing the subtle and elegant beauty of nature. The work fully reveals the subtle beauty of Suzhou's natural style, characterised by its gentle and elegant environmental features.

Fig. 3. Wu Guanzhong, Suzhou Gardens (pinyin: Suzhou Yuanlin), 1974, Size 150 cm × 200 cm, Oil on Canvas
(Source: Artron.Net (Wu, n.d.))

The renowned early 20th-century artist Wu Guanzhong created a series of paintings with themes of Jiangnan landscapes. These works are imbued with deep emotional elements (Lü, 2020). For example, his oil painting "Suzhou Gardens" (1974) (Fig. 3). The Suzhou Gardens are symbols of the city of Suzhou. Suzhou is a historical city located on the southeastern coast of China with a history of over 2,500 years. Its ancient urban area still retains its old scale and appearance, making Suzhou one of the oldest surviving cities in China (Zhang et al., 2023). Due to its preservation of a large number of gardens from various historical periods, Suzhou is acclaimed as the "City of Chinese Gardens" and has become a representative of private gardens in China (Suzhou Local Chronicles Compilation Committee, 2014).

Wu Guanzhong's "Suzhou Gardens" depicts a corner of the Suzhou Gardens. The painting features rugged rockeries, clear pond water, white walls with grey tiles, and lush green plants along the shore, all perfectly balanced. In reality, rockeries and white walls are cold, hard materials that can easily give a sense of coldness; however, the overall composition of the painting conveys a soft and harmonious feeling. Thus, it is evident that the work imparts profound meaning to Jiangnan architecture through the artist's perspective while reflecting the gentle and elegant qualities of the Suzhou environment, as observed by the artist.

Fig. 4. Chen Yifei, Sunset Suzhou (pinyin: Suzhou de huanghun), Circa 1989, Size 50.8 cm × 76.2 cm, Oil on Canvas
(Source: Christie's (Jessica Hsu, n.d.))

Fig. 5. Chen Yifei, Springtime in Suzhou (pinyin: Suzhou Chuntian), Circa 2001, Size 50.9 cm × 76.2 cm, Oil on Canvas
(Source: Christie's (Emmanuelle Chan, n.d.))

Chen Yifei created a series of paintings themed around Suzhou, including works such as "Sunset Suzhou" (1989) (Fig. 4)and "Springtime in Suzhou" (2001) (Fig. 5). These artworks feature houses along the riverbanks and clear river waters in Suzhou, capturing the unique scenery of the Jiangnan water towns.

There is a long-standing tradition of creating artworks based on water towns in the history of Chinese painting. For example, during the Ming Dynasty, painters often used landscape painting to express their personal emotions and artistic skills. In "Sunset Suzhou," Chen Yifei infused the painting with solid emotions and atmosphere. Using a dramatic contrast of light and shadow, he skilfully balanced the colours of the river and the sky, emphasising realism and reflecting the dramatic artistry he had brought to the work (Jessica Hsu, n.d.). From an environmental perspective, the painting shows the setting sun gently casting a golden glow on the white walls of the riverside houses, as if draping them in a golden veil. The deep blue sky reflects on the shimmering river surface, resembling a flowing painting. Although the stone steps along the river are ancient and weathered, they have rich historical charm. The work beautifully showcases Suzhou's graceful and elegant scenery, captivating the viewer.

In his other work, "Springtime in Suzhou" (2001), Chen Yifei delved deeper into the depiction of riverside houses amidst lush greenery. In this painting, the artist employed soft brushstrokes and colours to capture the unique scenery of Suzhou. The river flowed quietly, reflecting the houses' white walls and black tiles along its banks, conveying a sense of tranquillity and harmony. The water town is shrouded in a hazy light, giving every element in the painting a dreamy quality. From this painting, one can feel the warm spring sunlight filtering through thin clouds, illuminating Suzhou's ancient buildings and green plants, imbuing the entire city with a warm and harmonious atmosphere. The springtime in Jiangnan, with its air filled with the fragrance of flowers and a sense of moisture, profoundly influenced the artist's creative style and techniques. These two works, viewed from the artist's perspective, endow Suzhou's water town with a unique charm and reflect the gentle and elegant qualities of Suzhou's environment.

5.0 Discussion

This study explored how environmental factors influence the aesthetic qualities and artistic expression of Suzhou landscape oil paintings, revealing the role of Suzhou's unique natural environment in artistic creation. Throughout the research process, Taine's environmental perspective in his *The Philosophy of Art* (1873) provided theoretical support. Taine stated, "The products of the human mind, like the products of nature, can only be explained through their environment" (Taine, 1873: 33), offering a key insight into understanding how the natural environment affects the style and themes of artistic works.

This study found that Suzhou provides artists with abundant creative material. Influenced by environmental factors, artists select Suzhou's natural and cultural elements as painting subjects and showcase them in their works. For example, Fang Junbi created artwork themed around Tiger Hill Pagoda. According to the local Bureau of Culture, Broadcasting, and Tourism, Tiger Hill Pagoda is a leaning tower that tilts toward the northeast. Every autumn, the golden leaves at the foot of Tiger Hill enhance the beauty of the pagoda. Fang Junbi's oil painting aptly captures this scene (*Tiger Hill Pagoda*, 2021). In addition, Suzhou Gardens utilises typical Chinese architectural techniques, blending in an elegant and subtle inner charm (Mao, 2024). This is fully reflected in Wu Guanzhong's paintings. He combined the delicate beauty of the gardens with modern painting techniques, showcasing Suzhou's unique cultural heritage. At the same time, Suzhou's environment contains many important elements. A large portion of Taihu Lake's water surface is within Suzhou's boundaries, with its shimmering waters being an important natural landscape. Suzhou's ancient villages and old streets carry a rich history and culture (*Ziran Dili He Ziyuan (Physical Geography and Resources)*, 2024). These unique regional landscapes are delicately and vividly depicted in the works of Song Wenzhi and Chen Yifei, showcasing the profound cultural heritage and distinctive charm of Suzhou.

The findings of this study also indicated that Suzhou's natural environment has had a profound impact on the sensory experience of artistic creation. Located in the lower reaches of the Yangtze River, Suzhou has a mild climate with distinct seasons. The abundant rainfall and gentle seasonal changes provide artists with a unique visual and sensory experience (Shi & Zhang, 2020). For example, Fang Junbi depicted the ancient Tiger Hill Pagoda under the autumn sun as both warm and majestic; Song Wenzhi captured the fresh and gentle atmosphere of Dongting Lake in the spring. The works of Wu Guanzhong and Chen Yifei, through their portrayals of Suzhou Gardens, further expressed the tranquillity and harmony found in the environment, giving the viewer a sense of being fully immersed in the scene. This artistic approach demonstrates that these works are not merely reproductions of natural landscapes, but rather the embodiment of the artists' emotional resonance and sensory experiences as they interact with the environment.

6.0 Conclusion and Recommendations

Through an analysis of Suzhou-themed landscape oil paintings, this study reveals the close connection between artistic creation and environmental factors. Artworks, such as "Tiger Hill" (1948), "Spring Scenery of Dongting" (1960), "Suzhou Gardens" (1974), "Sunset Suzhou" (1989), and "Springtime in Suzhou" (2001) all showcase the gentle and elegant charm of Suzhou's environment, providing viewers with a rich and pleasing visual experience. These aesthetic qualities are derived from Suzhou's mild, humid climate and distinct seasonal changes (*About Suzhou*, n.d.). Artists draw inspiration from this environment and transform its unique charm into a rich visual experience.

This study concludes that environmental factors are crucial in artistic creation, providing rich material and imbuing artworks with profound meaning and unique aesthetic value. The landscapes of Jiangnan water towns, ancient alleyways, and garden scenery in Suzhou have deeply influenced the artists' creations. Their works not only reproduce the natural scenery but also celebrate the unique environmental charm of Suzhou. These pieces are both a representation of Suzhou's natural beauty and a tribute to its distinctive

environmental allure. Through these works, artists convey Suzhou's gentle and elegant beauty to the audience, evoking an appreciation for its environmental atmosphere.

The contribution of this study lies in raising public awareness of Suzhou-themed landscape paintings, encouraging viewers not only to appreciate the visual beauty of the works but also to reflect on the environmental influences behind them. Additionally, the study enriches academic understanding of the role of environmental factors in artistic creation and lays a foundation for future research in related fields. However, the scope of works analysed in this study is relatively limited. Future research could expand by including artworks from different periods and styles, particularly those reflecting Suzhou's modern urbanisation process, to explore the complex relationship between environment and artistic creation more comprehensively.

Acknowledgement

I sincerely thank my supervisor, Associate Professor Dr. Sarena Abdullah, for her unwavering patience and guidance. Her insightful mentorship has been invaluable not only in the writing of this article but also throughout all my other works. Her support has profoundly shaped my academic journey, and I am deeply thankful for her continued encouragement and wisdom.

Paper Contribution to Related Field of Study

This study significantly contributes to the field by conducting an in-depth analysis of Suzhou-themed landscape oil paintings using the environmental factors outlined in Taine's *The Philosophy of Art* (1873). The research reveals how Suzhou's unique climate and cultural environment have shaped the aesthetic qualities of these artworks, thereby deepening our understanding of the role of the environment in artistic expression.

References

About Suzhou. (n.d.). Suzhou Municipal People's Government. Retrieved 24 June 2024, from https://english.suzhou.gov.cn/

Alicja Zelazko. (n.d.). *Oil Painting*. Britannica. Retrieved 2 July 2024, from https://www.britannica.com/art/oil-painting

Emmanuelle Chan. (n.d.). *Chen Yifei (1946–2005), Springtime in Suzhou*. Christie's. Retrieved 14 July 2024, from https://www.christies.com.cn/zh/lot/lot-6321070?&lid=1&sc_lang=en

G. Morton, M. (2002). Art History on the Academic Fringe: Taine's Philosophy of Art. In E. Mansfield (Ed.), *Art History and Its Institutions- Foundations of a Discipline* (pp. 215–228). Routledge.

Guan Shan Yue Art Museum Researcher. (n.d.). *Song Pei*. Jiangsu Traditional Chinese Painting Institute. Retrieved 1 July 2024, from http://jstcpi.com/html/web/zuzhijiegou/renyuanchengguo/yishupinglun/3986716544243243.html

He, P., & Tian, X. (2020). Jiyu danna 'san yinsu' lilun de hou yinxiangpai huihua yanjiu (Research on Post-Impressionist Painting Based on Taine's 'Three-Factor' Theory). *Fine Arts*, *01*, 66–67.

Jessica Hsu. (n.d.). *Chen Yifei (China, 1946–2005), Sunset Suzhou*. Christie's. Retrieved 14 July 2024, from https://www.christies.com.cn/zh/lot/lot-6181641?&lid=1&sc_lang=en

Liu, Y. (2008). *On Taine's Art Social Theory (Lun danna yishu shehui lilun)* [Master]. Hebei University.

Lü, H. (2020). "Combine Things"—Wu Guanzhong's Emotion and Fusion Road of Painting Art. *Frontiers in Educational Research*, *3*(14), 86–90.

Mao, J. (2024). Zhongshi shenmei xia de Zuzhou yuanlin (Suzhou Gardens under Chinese Aesthetics). *Popular Literature*, *08*, 46–48. https://doi.org/10.20112/j.cnki.ISSN1007-5828.2024.08.017

Shi, H., & Zhang, C. (2020). Cong danna san yaosu qian tan suzhou shuiyin banhua (A Brief Discussion on Suzhou Watermark Prints from the Perspective of Taine's Three Elements). *Art Education Research*, *12*, 23–25.

Song, W. (n.d.). *Dongting chunse (Spring Scenery of Dongting)*. Artron. Retrieved 1 July 2024, from https://m-exhibit.artron.net/works/658914.html

Song Wenzhi-The Pioneer of Chinese Modern Painting Innovation_History and Culture. (2021, June 23). Suzhou Municipal People's Government. https://www.suzhou.gov.cn/szsenglish/szlswh/202106/b99f78db6dda41dd942578ab76c7ce2c.shtml

Suzhou Local Chronicles Compilation Committee. (2014). *Suzhou Shizhi 1986–2005* (Vol. 1). Phoenix Science Press.

@Suzhou ren, 213 jian huazuo Yao Nin Gong Shang Ruhua Xin Jiangnan! (@Suzhou Residents, 213 Paintings Invite You to Enjoy the Picturesque New Jiangnan Together!). (2023, August 26). Jiangsu. http://www.ourjiangsu.com/a/20230826/1693017230317.shtml

Suzhou taihu dongting shan biluochun zhizuo jiyi (Suzhou Taihu Dongting Mountain Biluochun production techniques). (n.d.). Suzhou Intangible Cultural Heritage Information Network. Retrieved 1 July 2024, from https://szfy.wglj.suzhou.com.cn/gjml/2123

Taine, H. (1873). *The Philosophy of Art* (J. Durant, Trans.). Holt & Williams.

Tiger Hill (Hu Qiu). (1948). Artnet. https://www.artnet.com/artists/fang-junbi/suzhouhuqiuta-tiger-hill-tUmFTCuQO-EGbgjd1Yw2w2

Tiger Hill Pagoda. (2021, October 29). Suzhou Municipal People's Government. https://www.suzhou.gov.cn/szwgjyhsj/yhsjjbgk/202110/560fc6c80c7746b98704ecd6fc24e5f0.shtml

Ventresca, M. J., & Mohr, J. W. (2017). Archival Research Methods. In *The Blackwell Companion to Organizations* (pp. 805–828). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781405164061.ch35

Wu, G. (n.d.). *Suzhou yuanlin (Suzhou gardens)*. Artron. Retrieved 1 July 2024, from https://wuguanzhong.artron.net/works_detail_brt0001320229

Xu, R. (2015). *Evolution from Natural Aesthetics to Ecological Aesthetics in The Cases of Hegel, Taine And Leopold's Aesthetics' Theories* [Master's Theses]. Master's Theses.

Zhang, T., Yan, M., Yu, X., & Liu, B. (2023). Visual Assessment of Historic Landmarks Based on GIS and Survey: A Study of View and Viewing of Tiger Hill in Suzhou, China. *Jounal of Asian Architecture and Building Engineering*, *23*(3), 1079–1093.

Ziran dili he ziyuan (Physical Geography and Resources). (2024, June 3). Suzhou Municipal People's Government. https://www.suzhou.gov.cn/szsrmzf/szgl/szgl.shtml

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta
https://arcadesa.isi.ac.id/index.html
8th Art, Craft and Design in Southeast Asia International Symposium
ISI Yogyakarta Indonesia, 27-28 September 2024
Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Application of Kansei Engineering and Analytic Hierarchy Process in Evaluating Design Elements of Traditional Nyonya Kebaya

Guo Chunli[1,2], Siti Rohaya Yahaya[1*], Liu Mingquan[1], Zhang Ning[2]
**Corresponding Author*

[1] School of Arts, Universiti Sains Malaysia, Penang, Malaysia
[2] Nanchang Key Laboratory of Clothing Digital System Design, Jiangxi Institute of Fashion Technology, Nanchang, China

guochunli@student.usm.my, ysrohaya@usm.my, liumingquan7788@student.usm.my, zhangning@jift.edu.cn
Tel: +60148589469

Abstract
This study utilised the Analytic Hierarchy Process (AHP) and Kansei Engineering to assess the design elements of traditional Nyonya Kebaya. Based on expert interviews and surveys, it identified four primary indicators—colour, pattern, structure, and technique—and 16 secondary indicators. AHP was used to determine the weights and assess consistency. Results indicated that colour and technique are the most influential, with weights of 0.347 and 0.266. The secondary indicators "Bright," "Exquisite," "Elegant," and "Slim" were found to impact consumer perception significantly.

Keywords: Nyonya kebaya; analytic hierarchy process; Kansei engineering; design elements

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6161

1.0 Introduction

1.1 Background

Traditional Nyonya Kebaya is a significant symbol of Malaysian culture, embodying a rich history and cultural heritage. However, with the evolution of modern design concepts, balancing the preservation of traditional features with the demands of contemporary consumers is a pressing challenge.

1.2 Problem Statement

Despite being part of the Peranakan heritage and recognised as an intangible cultural heritage of Penang, Nyonya Kebaya's craftsmanship and cultural significance are at risk due to modernisation and the erosion of cultural transmission (Ahmad, 2015). Declining market interest and reduced enthusiasm among the younger generation for traditional crafts have further endangered its production techniques and cultural legacy (Abd Kadir & Adnan, 2022). Moreover, the lack of effective marketing and brand development has weakened Nyonya Attire's international competitiveness, impacting its sales growth and economic viability (Rosihan & Aris, 2022). This study aims to systematically extract and analyse the design elements of Nyonya Kebaya using a combined approach of the Analytic

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6161

Hierarchy Process (AHP) and Kansei Engineering, providing a scientific basis for innovative design. The goal is to understand consumer preferences and emotional responses to these design elements, thereby informing the modern design of Nyonya Kebaya.

2.0 Literature Review

2.1 Traditional Nyonya Kebaya

The Nyonya Kebaya is a traditional garment of significant cultural and historical importance in Malaysia, particularly in Penang and Malacca. It originated from the Peranakan Chinese community, with conventional Nyonya Kebaya as a symbolic attire within Peranakan culture, showcasing a rich blend of cultural elements (Abd Kadir & Adnan, 2022). The Nyonya Kebaya is renowned for its intricate embroidery, vibrant fabrics, and unique patterns, symbolising cultural heritage and craftsmanship (Ng, 2023). The traditional markets, cultural festivals, and exhibitions in Penang provide a rich context for exploring Nyonya Kebaya's contemporary relevance, making it an essential centre for Peranakan culture (Neo, 2020). While traditional Nyonya Kebaya is symbolic of cultural heritage and reflects Malaysia's multicultural integration, it is perceived by some as impractical and outdated (Trismaya et al., 2022). Understanding and innovating the Nyonya Kebaya from the perspective of the consumers who wear it is essential.

2.2 Kansei Engineering

Kansei Engineering is a predictive technology that uses semantic differential techniques to measure users' subjective feelings (Nagamachi, 1995). There is limited research on the design characteristics and Kansei words specifically associated with Nyonya Kebaya (Sugiman & Yahya, 2022). According to Bongard-Blanchy et al. (2013)Kansei Engineering extracts evaluative adjectives through interviews and literature reviews to create a semantic space, enabling consumers to assess and select adjectives that best describe their emotional responses. Rajasekera and Karunasena (2015) demonstrated that Kansei Engineering helps Sri Lankan fashion designers better align their creations with global market demands, showcasing the method's broad applicability in fashion design.

Several studies have demonstrated that Kansei Engineering effectively captures and translates consumers' emotional and sensory responses to various clothing designs. For example, Yu et al. (2020) and Ying et al. (2020) studied Kansei evaluations of qipaos and women's bras, respectively, while Zhang and Mu (2021) analysed Kansei perceptions of suit styles and men's shirt collars. These studies offer valuable insights into how consumer emotions influence their preferences in apparel design. However, no research has yet explored the Kansei aspects of Nyonya Kebaya, signalling a significant gap in the literature.

Although these studies provide useful frameworks for understanding Kansei's perception of fashion design, their relevance to specific cultural garments like the Nyonya Kebaya is limited. Schütte and Marco-Almagro (2018) emphasized the importance of collaborative Kansei Engineering for optimizing designs, which could be applied to the integration of both aesthetic and functional elements in Nyonya Kebaya. They also discussed the use of online tools for Kansei evaluation, which could assist in gathering and analyzing consumer preferences regarding Nyonya Kebaya. Kandambi and Lekamge (2022) explored the application of Kansei colour concepts in web design, a principle that could be adapted to examine the emotional impact of color choices in Nyonya Kebaya fabrics.

Future research should aim to address the existing gap by expanding sample sizes and examining the effects of Nyonya Kebaya's design elements on consumer emotions. Such research would enhance both the comprehensiveness and practical relevance of Kansei Engineering in the context of this culturally significant attire.

3.0 Methodology

3.1 Analytical Methods in Design

In recent years, the combined use of the Analytic Hierarchy Process (AHP) and Kansei Engineering has gained significant academic recognition and application in developing new clothing and apparel products (Tang et al., 2020). The core concept of this approach is to systematically determine consumer demand for various indicators of clothing products using AHP, thereby avoiding subjective biases in the demand analysis process. After clarifying these demands, Kansei Engineering is used further to analyse the consumers' emotional needs regarding the products, translating these needs into specific design elements to guide product development.

To gain a deeper understanding of market preferences for the design elements of traditional Malaysian Nyonya Kebaya, this study selected consumers aged 20 and 35 who had purchasing experience within the past year. Through AHP and Kansei Engineering, the study systematically analysed consumer preferences and emotional needs related to the design elements of Nyonya Kebaya. The findings will help designers quantify and specify product requirements, optimising design solutions to meet market needs.

3.2 Data Collection

This study examines the design elements of traditional Nyonya Kebaya in Malaysia using Kansei Engineering, supported by the Analytic Hierarchy Process (AHP). Data were collected from historical literature and field research, focusing on emotional perceptions of Nyonya Kebaya. A total of 10 Nyonya Kebaya samples from Penang were collected from museums and Peranakan cultural communities, selected for their diverse design elements to identify emotional triggers using Kansei Engineering.

Interviews were conducted with 20 respondents aged 20-35, including cultural scholars, museum staff, designers, students, and homemakers. This diverse sample provided a broad understanding of consumer sentiments. The interviews generated 44 emotional

descriptors (evaluative adjectives), which were encoded and analysed for frequency using Excel. This aligns with Kansei Engineering's goal of linking design elements with emotional responses.

The AHP framework was used to weigh the importance of emotional descriptors against key design elements like colour, structure, and pattern, allowing for a structured evaluation of these features based on consumer responses.This research contributes to the modernisation of Nyonya Kebaya by providing insights into consumer preferences. Future studies could expand the respondent base or sample size to further validate these findings.

3.3 Evaluation Design System Construction

3.3.1 Identification and Collection of Traditional Nyonya Kebaya Design Elements

Visual Approach Content Analysis is a qualitative research method primarily used to analyse the content and meaning of visual materials. This method combines visual studies and content analysis strengths by systematically analysing symbols and information in visual media, such as images and videos, revealing their significance and impact.

Fig. 1: Experimental samples and numbers
(Source: Pinang Peranakan Mansion)

Table 1. Kansei's words from interviews

Code	Age	Sex	Occupation	Objectives
1.Lee	25	Male	Museum Staff	Traditional Simple Bright Elegant Colorful Complex
2.Elida	30	Female	Fashion Designer	Classic, Beautiful, Bright, Fashionable, Simple
3.Anna	32	Female	Fifth-Generation Peranakan	Simple, elegant, Unique, Exquisite Noble Subtle Classic
4.Yu	35	Female	Kebaya Brand Designer	Exquisite Reserved Bright Special Graceful Colorful
5.Rani	33	Female	Nyonya Culture Researcher	Graceful, Simple, Comfortable, Complex Neatness
6.Nina	28	Female	Nyonya Kebaya Store Owner	Comfortable Elegant Noble Fine Slimming Luxurious Slim
7.Ying	20	Female	Museum Staff	Distinct Exquisite Confident Complex Feminine
8.Wei	29	Male	Brand Store Owner	Slim, Steady, Mysterious, High-quality Traditional Complex Fine
9.Hua	31	Male	Nyonya Kebaya Store Owner	Complex Special Sexy Outstanding Elegant Slim
10.Fen	32	Female	Housewife	Traditional Graceful, High-quality Lady-like Beautiful
11.Ting	23	Female	Student	Close-fitting Feminine Noble Glowing Diversity Elegant
12.Jun	24	Female	Student	Elegant Gentle Attractive Unique Slim-fitting
13.Min	22	Male	Student	High-quality Exquisite Attractive Feminine Refined
14.Alice	26	Female	Clothing Store Clerk	Unique Pure Fresh Unique Elegant Comfortable
15.Lim	31	Male	Traditional Clothing Enthusiast	Subtle, Lively, Elegant, Festive Noble
16.Lily	29	female	Nyonya Culture Researcher	Lively, Elegant Outstanding, Luxurious Feminine
17.May	35	female	Housewife	Colourful, Elegant, Confident Striking
18.Liu	30	female	Housewife	Special Sexy Outstanding Elegant ComplexFeminine
19.Tong	35	Male	Artist	Reserved Bright Special Graceful Unique Slim-fitting Dignified
20.Bin	33	Male	University Lecturer	Bright, Fashionable, Simple, Feminine, Refined, Subtle Distinct

(Source: Table by Author)

Design element requirements refer to consumers' core expectations regarding Nyonya Kebaya's design. Using the Visual Approach Content Analysis method, this study analysed 10 traditional Nyonya Kebaya samples, identifying and categorising four main design elements: structure, pattern, technique, and colour. These design elements represent the aesthetic characteristics of traditional Nyonya Kebaya and reflect its historical and cultural significance.

3.3.2 Construction of Evaluation Design Indicators

This study gathered opinions through questionnaires and expert interviews, identifying colour, pattern, structure, and technique as primary indicators influencing consumer purchasing decisions. Starting from this point, all relevant Kansei words collected in Table 1 were initially categorised into four groups: structure, pattern, technique, and colour. Similar and related words were merged and filtered to ensure that the words in each category accurately reflected consumer perceptions. Based on the categorised, filtered, and merged words, 16 representative secondary indicators were further refined, establishing the evaluation indicator system as shown in Table 2.

Table 2. Evaluation index system

Primary Indicators	Secondary Indicators
Colour	Colourful
	Subtle
	Bright
Pattern	Simple
	Graceful
	Classic
	Distinct
Structure	Traditional
	Comfortable
	Close-fitting
	Slim
	Unique
Technique	Feminine
	Complex
	Exquisite
	Elegant

(Source: Table by Author)

4.0 Findings

4.1 Establishing the Analytic Hierarchy Process (AHP) Model

The Analytic Hierarchy Process (AHP) is a research method that transforms qualitative issues into quantitative analysis by establishing hierarchical objectives and conducting comprehensive evaluations. In this study, AHP was utilised to categorise the factors influencing consumer decisions in online customisation into three levels of indicators. The specific evaluation indicators for the AHP model are illustrated in Figure 2.

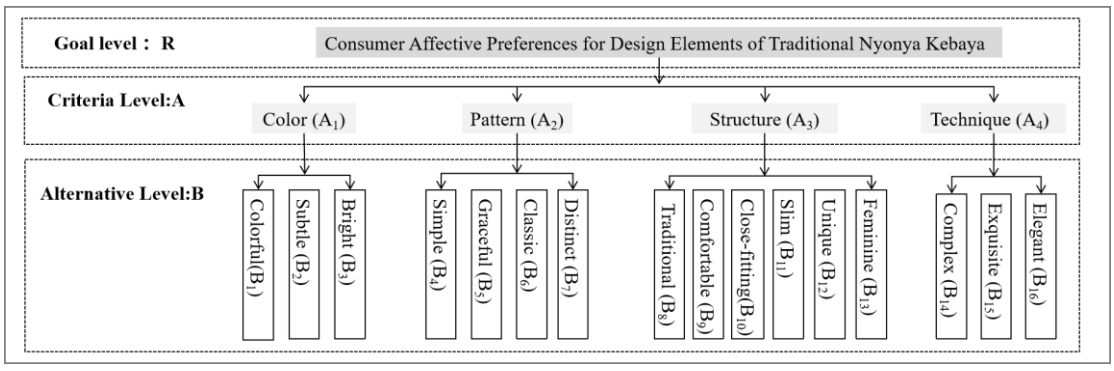


Fig. 2: Hierarchy analysis model

(Source: Author)

4.2 Construction of the Judgment Matrix

When choosing customisation options, consumers are influenced by the factors shown in Figure 1. This study used AHP to establish a pairwise comparison judgment matrix to explore how each factor affects consumers. This matrix helps determine the weights of each indicator at different levels of relative importance. The importance ratio between two indicators (a_i, a_j) is denoted as *air*, with their relative importance scaled using values from 1 to 9 and their reciprocals. The meaning of these scale levels is presented in Table 3 (Hong et al., 2002), which shows that a_{ij} represents the ratio of the importance of a_i to a_j.

Table 3. Meaning of grade scale

Serial Number	Meaning of Scale	Ratio Value
1	Two indicators are equally important for a particular attribute	$a_{ij}=1$
2	One indicator is slightly more important than the other	$a_{ij}=3$
3	One indicator is slightly more important than the other	$a_{ij}=5$
4	One indicator is slightly more important than the other	$a_{ij}=7$
5	One indicator is slightly more important than the other	$a_{ij}=9$
6	Represents the scale when a compromise between the two above standards is needed	$a_{ij}=2,4,6,8$
7	The reverse comparison of two indicators	$1/a_{ij}$

(Source: Table by Author)

4.3 Construction of the Judgment Matrix

A judgment matrix was constructed based on Table 3. For this study, 15 experts were consulted, and the results from the questionnaires were summarised to list the pairwise comparison matrix of each indicator. Equation (1) shows the calculation of the maximum eigenvalue.

$$\lambda_{max} = \sum_{i=1}^{n} \frac{[\overline{A}W]_i}{nW_i} \quad (1)$$

The formula is shown as Equation (1), where λ_{max} is the maximum eigenvalue of the matrix, $\overline{A}$Is the judgment matrix, W is the weight vector, and [$\overline{A}$W]i represents the i-th component of the matrix [$\overline{A}$W].

The consistency index (CI) is calculated using Equation (2), and the consistency ratio (CR) is given by Equation (3).

$$\mathrm{CI} = \frac{\lambda_{max}-n}{(n-1)} \quad (2)$$

$$CR = \frac{CI}{RI} = \frac{\lambda_{max}-n}{(n-1)RI} < 0.1 \quad (3)$$

In the formulas, CI stands for the Consistency Index, CR is the Consistency Ratio, and RI represents the Random Consistency Index. If CR < 0.1, it indicates that the matrix meets the required consistency and does not need modification. Otherwise, experts should be consulted to revise the judgment matrix until the calculation results in CR < 0.1.

The weights of the indicators are shown in Tables 4 to 8. According to Equation (2), the closer λ_{max} is to N, the more consistent the CI, resulting in more minor judgment errors. The matrix is considered to have satisfactory consistency if all judgment matrices have CR < 0.1. For a 4-level matrix, the Random Consistency Index is 0.89, and for a 5-level matrix, it is 1.12.

Table 4. *A-R* judgment matrix of criterion layer

R	A_1	A_2	A_3	A_4	W_i	λ_{max}	CI	CR
A_1	1	2.111	1.470	1.463	0.347	4.064	0.021	0.024
A_2	0.474	1	0.414	0.628	0.141			
A_3	0.680	2.417	1	0.698	0.246			
A_4	0.684	1.593	1.433	1	0.266			

(Source: Table by Author)

Table 5 Judgment matrix of B_1-B_3 on A_1

A_1	B_1	B_2	B_3	W_i	λ_{max}	CI	CR
B_1	1	1.374	0.338	0.231	3.037	0.018	0.035
B_2	0.728	1	0.436	0.204			
B_3	2.960	2.296	1	0.565			

(Source: Table by Author)

Table 6. Judgment matrix of B_4-B_7 on A_2

A_2	B_4	B_5	B_6	B_7	W_i	λ_{max}	CI	CR
B_4	1	1.132	0.252	0.286	0.114	4.062	0.021	0.023
B_5	0.884	1	0.504	0.279	0.127			
B_6	3.963	1.984	1	0.935	0.351			
B_7	3.496	3.578	1.069	1	0.408			

(Source: Table by Author)

Table 7. Judgment matrix of B_8-B_{13} on A_3

A_3	B_8	B_9	B_{10}	B_{11}	B_{12}	B_{13}	W_i	λ_{max}	CI	CR
B_8	1	0.677	0.227	0.170	0.434	1.395	0.066	6.189	0.038	0.030
B_9	1.478	1	0.774	0.554	1.198	4.015	0.158			
B_{10}	4.396	1.292	1	0.349	2.784	3.954	0.219			
B_{11}	5.883	1.804	2.862	1	4.540	5.722	0.398			
B_{12}	2.306	0.835	0.359	0.220	1	1.845	0.106			
B_{13}	0.717	0.249	0.253	0.175	0.542	1	0.053			

(Source: Table by Author)

Table 8. Judgment matrix of B_{14}-B_{16} on A_4

A_4	B_{14}	B_{15}	B_{16}	W_i	λ_{max}	CI	CR
B_{14}	1	0.351	0.608	0.187	3.039	0.020	0.038
B_{15}	2.847	1	0.956	0.437			
B_{16}	1.646	1.046	1	0.375			

(Source: Table by Author)

4.4 Hierarchical Comprehensive Ranking

Tables 4-7 show that the CI for each judgment matrix is less than 0.1, indicating that they all meet the consistency test requirements. The importance of evaluation indicators in the plan layer (P) is compared and ranked relative to the extent of the goal layer (O). The weights after hierarchical ranking are presented in Table 9.

Table 9. Emotional Perception Ranking of Nyonya Kebaya Design Elements Based on AHP

Alternative Level: B	Indicator Weights				Weighted Scores	Rankings
	A_1 （0.347）	A_2 （0.141）	A3 （0.246）	A4 （0.266）		
B_1	0.231				0.080	5
B_2	0.204				0.071	6
B_3	0.565				0.196	1
B_4		0.114			0.016	14
B_5		0.127			0.018	13
B_6		0.351			0.049	10
B_7		0.408			0.058	7
B_8			0.066		0.016	15
B_9			0.158		0.039	11
B_{10}			0.219		0.054	8
B_{11}			0.398		0.098	4
B_{12}			0.106		0.026	12
B_{13}			0.053		0.013	16
B_{14}				0.187	0.050	9
B_{15}				0.437	0.116	2
B_{16}				0.375	0.100	3

(Source: Table by Author)

4.5 Establishment of the Evaluation Model

Based on the above results, the final tiered evaluation model of consumer emotional perception for traditional Nyonya Kebaya design elements is presented in Table 10.

Table 10. Evaluation Model of Nyonya Kebaya Design Elements under Emotional Perception

Criteria Level: A			Alternative Level: B		Total Weights	Overall Rankings
Evaluation Indicators	Weight	Ranking	Evaluation Indicators	Relative Weight		
A_1	0.347	1	B_1	0.231	0.080	5
			B_2	0.204	0.071	6
			B_3	0.565	0.196	1
A_2	0.141	4	B_4	0.114	0.016	14
			B_5	0.127	0.018	13
			B_6	0.351	0.049	10
			B_7	0.408	0.058	7
A_3	0.246	3	B_8	0.066	0.016	15
			B_9	0.158	0.039	11
			B_{10}	0.219	0.054	8
			B_{11}	0.398	0.098	4
			B_{12}	0.106	0.026	12
			B_{13}	0.053	0.013	16
A_4	0.266	2	B_{14}	0.187	0.050	9
			B_{15}	0.437	0.116	2
			B_{16}	0.231	0.100	3

(Source: Table by Author)

4.6 Analysis of the Evaluation Model

Table 10 shows the results of the weight assessment of traditional Nyonya Kebaya design elements using the Analytic Hierarchy Process (AHP), establishing an evaluation model that reflects consumer emotional perception. The analysis reveals that colour and technique are the most significant factors influencing consumer perception in the criteria layer, with weights of 0.347 and 0.266, respectively. This indicates that consumers prefer bright colours and fine craftsmanship in Nyonya Kebaya designs more than other elements. Pattern and structure factors have lower weights, at 0.141 and 0.246, respectively, suggesting their lesser impact on overall perception.

Among the secondary indicators, "Bright," "Exquisite," "Elegant," and "Slim" were rated as the most influential emotional descriptors, holding the top four positions in weight. These results highlight the need for Nyonya Kebaya designs to emphasise vibrant, exquisite, and elegant characteristics to meet consumers' aesthetic and personalisation needs. Additionally, "High quality" and "Comfortable" also have relatively high weights, indicating that consumers have high expectations for the comfort and quality of the clothing.

Overall, the AHP model results reveal that consumers focus more on visual and tactile emotional factors when choosing Nyonya Kebaya, such as the brightness of colours and the texture of fabrics. These findings provide essential guidance for designers, who should pay attention to colour selection and craftsmanship details during the design process to enhance the garments' market appeal and consumer satisfaction.

Future research could consider further segmenting the consumer groups to explore the differences in emotional perception of Nyonya Kebaya among consumers of different cultural backgrounds, ages, and genders. Additionally, integrating modern technologies such as virtual fitting and artificial intelligence could further optimise the design process to meet the diverse needs of consumers.

5.0 Discussion

5.1 importance of Colour and Craftsmanship

The study highlights the critical role of colour and craftsmanship in Nyonya Kebaya design, reflecting their significant influence on consumer preferences and the cultural and aesthetic values these garments embody.

5.2 Implications for Design Practice

Consumers' preferences for attributes like brightness, elegance, and sophistication suggest that designers balance innovation with preserving traditional elements, creating designs that appeal to modern tastes while maintaining cultural heritage.

5.3 Future Research and Technological Integration

The study acknowledges limitations such as sample size and cultural specificity, suggesting future research should expand sample diversity. Additionally, integrating modern technologies like 3D printing and digital embroidery can enhance customisation and appeal, supporting Nyonya Kebaya's adaptation in contemporary markets.

6.0 Conclusion and Recommendations

6.1 Conclusion

This study systematically analysed the design elements of traditional Nyonya Kebaya using the Analytic Hierarchy Process (AHP) and Kansei Engineering. The findings confirm that colour and craftsmanship are the most significant factors influencing the aesthetic appeal of Nyonya Kebaya, emphasizing the necessity of preserving these design aspects. Key emotional descriptors identified through the analysis include "Bright," "Exquisite," "Elegant," and "Slim." These descriptors represent critical emotional responses from consumers and provide valuable insights for designers aiming to meet consumer preferences in modernising Nyonya Kebaya while retaining its cultural heritage.

6.2 Recommendations

Based on the findings, the study suggests that designers should focus on vibrant colours and intricate craftsmanship in Nyonya Kebaya to honour traditional values and appeal to modern consumers. Emphasising comfort and elegance can enhance consumer satisfaction and attract a wider audience. Future research and design efforts should explore modern technologies like digital embroidery and 3D printing to improve design precision and appeal to younger consumers while maintaining traditional craftsmanship. Additionally, promoting Nyonya Kebaya as a cultural heritage through educational initiatives, cultural activities, and strategic marketing can expand its market influence locally and internationally. Future studies should include more diverse samples to understand emotional and perceptual responses across different cultural and demographic groups, guiding more inclusive and diverse design strategies. These insights are valuable for designers and marketers to understand consumer preferences better and enhance the appeal of Nyonya Kebaya, balancing innovation with tradition. The study contributes to fashion design and cultural studies, providing insights relevant to other traditional clothing and cultural heritage design.

Acknowledgement

We wish to extend our gratitude to Universiti Sains Malaysia (USM) and Pinang Peranakans Mansion for their resources and support, which enabled the completion of this research.

Paper Contribution to Related Field of Study

This study combines the Analytic Hierarchy Process (AHP) and Kansei Engineering to systematically identify and evaluate the design elements of traditional Nyonya Kebaya. Quantitating consumer preferences and emotional responses provides theoretical guidance for modernising traditional cultural designs. This contribution helps protect cultural heritage while adapting to modern market demands and provides a framework applicable to various cultural and product contexts.

References

Abd Kadir, F., & Adnan, W. H. (2022). Comparative of Cultural Material Study Between Baba Nyonya Original Descendants and Baba Nyonya New Descendants in Malacca. *EDUCATUM Journal of Social Sciences*, *8*, 46-58.

Ahmad, A. T. (2015). Penang Museums, Culture and History. *Kajian Malaysia: Journal of Malaysian Studies*, *33*.

Bongard-Blanchy, K., Bouchard, C., & Aoussat, A. (2013). Limits of kansei-kansei unlimited. *International Journal of Affective Engineering*, *12*(2), 145-153.

Hong, Z., Li, Y., Fan, Z., & Wang, Y. (2002). Calculation on high-ranked RI of analytic hierarchy process. *Computer Engineering and applications*, *38*(12), 45-47.

Kandambi, K. C., J, & Lekamge, L. (2022). Kansei Color Concepts for E-Commerce Website Design–A Case Study Using Designerwear Websites. 2022 Moratuwa Engineering Research Conference (MERCon),

Nagamachi, M. (1995). Kansei engineering: a new ergonomic consumer-oriented technology for product development. *International Journal of industrial ergonomics*, *15*(1), 3-11.

Neo, D. H. (2020). Tan Sooi Beng (Ed), Eclectic Cultures For All: The Development of the Peranakan Performing, Visual and Material Arts in Penang. *SARE: Southeast Asian Review of English*, *57*(1), 232-234.

Ng, J. (2023). *The'lost'Peranakan Reimagined: Creating new interpretation of lost Peranakan objects through contemporary artistic imagination* Birmingham City University].

Rajasekera, J., & Karunasena, H. (2015). Apparel design optimization for global market: Kansei engineering preference model. *International Journal of Affective Engineering*, *14*(2), 119-126.

Rosihan, M., & Aris, A. (2022). The influence of cultural values towards creativity enhancement: the case of Malaysian fashion designers. *International Journal of Art and Design (IJAD)*, *6*(1), 94-108.

Schütte, S., & Marco-Almagro, L. (2018). Development and application of online tools for kansei engineering evaluations. 7th International Conference on Kansei Engineering & Emotion Research 2018, 19-22 March 2018, Kuching, Malaysia,

Sugiman, A. L. B., & Yahya, H. B. (2022). Publication: DIY Accessories Making With Nyonya Batik Style. 2022 Engineering and Technology for Sustainable Architectural and Interior Design Environments (ETSAIDE),

Tang, G., Kang, Y., & Pu, J. (2020). Research on Tactile Perception of Female Bag Materials Based on Kansei Engineering. *Leather Science and Engineering*, *30*(4), 77-81.

Trismaya, N., Shahab, Y. Z., & Siscawati, M. (2022). From Glamorous to Everyday Value: Kebaya as the Medium of Women's Self-Expression. *Wacana: Jurnal Sosial dan Humaniora*, *25*(3).

Ying, Z., Jie, Z., Siyan, Z., & Xue, L. (2020). Bra style design based on kansei engineering and analytic hierarchy process. *Basic Sciences Journal of Textile Universities/Fangzhi Gaoxiao Jichu Kexue Xuebao*, *33*(3).

Yu, M.-J., Chen, C.-C., Wu, S.-M., & Chen, Q.-D. (2020). Explore the Critical Kansei Quality of Fashion Design. *DEStech Transactions on Computer Science and Engineering*. https://doi.org/10.12783/dtcse/cmso2019/33617

Zhang, J., & Mu, Y. (2021). Clothing design methods based on Kansei engineering: example of suit design. Advances in Industrial Design: Proceedings of the AHFE 2021 Virtual Conferences on Design for Inclusion, Affective and Pleasurable Design, Interdisciplinary Practice in Industrial Design, Kansei Engineering, and Human Factors for Apparel and Textile Engineering, July 25-29, 2021, USA,

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Reflections on the Application of Low-Tech in Landscape Architecture Design amid Environmental Crisis

Tang Tingqiang

Shanghai Art & Design Academy,
Shanghai, China

616697811@qq.com

Abstract
The post-modern focus on landscape and vernacular architecture emerged from ecological concerns due to resource crises, critiquing high-tech resource consumption and uniform aesthetics. Low-tech landscape architecture integrates traditional and modern architecture, utilizing passive ecological technologies. This approach seeks to modernize energy use in landscape architecture, fostering innovation within low-tech frameworks. Policies and regulations ensure that construction meets aesthetic and technical standards, emphasizing local materials and sustainability. These methods promote sustainable development and harmonious coexistence with nature, offering new avenues for architectural design and landscape art amid environmental challenges.

Keywords: Environmental crisis; landscape architecture design; aesthetics; low-tech application; development

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6160

1.0 Introduction

Low-tech architecture represents an aesthetic philosophy that emerged after modernist architecture. It has been a significant architectural and aesthetic reflection based on regional primitive typological construction techniques from the 1960s to the present. This primitive typology originates from Marc-Antoine Laugier's theory of the "primitive hut" described in his work "Essay on Architecture," which posits that all architectural elements stem from necessity. These necessities encompass the fundamental components of architecture and are the essential elements of construction technology. The primitive, rustic hut embodies all the essential components later seen in architecture, such as the base, eaves, columns, pediments, and roof. The hut serves as a prototype upon which all architectural aesthetics can be conceptualized.

The advent of industrialization gave rise to the "paradigm typology," a type of architecture that can be mass-produced through standardization. This typology focuses on the generation of new kinds, with industrialization enhancing efficiency for users but diminishing the aesthetic diversity celebrated by the first typology. The standardization of technical norms homogenized architectural aesthetics, leading to a proliferation of uniform, high-tech industrial buildings and the standardization of architectural elements. As paradigm typology dismissed architecture's original aesthetic and emotional factors, the 1960s saw the emergence of the New

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6160

Rationalist Typology. Pioneered by Aldo Rossi, this third typology extended the concept to include style, form, and other aesthetic dimensions, as well as urban organization, structure, history, and cultural elements, emphasizing architectural aesthetics centered on humanistic connotations and lifestyles.

Hence, it is evident that humans are fundamental to creating architectural aesthetics, and low-tech architectural art is an effective means to reshape emotional aesthetics. Awareness of the environmental resource crisis in construction represents self-awareness; the ability to curb high-end consumption reflects self-control, and advocating for harmonious, sustainable development between humans and nature is a moral virtue of beauty.

In the aftermath of architectural modernization, vast rural and traditional architectures lost their original aesthetic appeal, with severe resource wastage characterizing industrialized construction. This has led to a paradoxical culture. Additionally, the ecological concerns stemming from the resource crisis have garnered attention in architectural art, ultimately reflecting a critique of high-energy, high-pollution development and a rejection of industrial products devoid of aesthetic culture.

This study responds to these ecological and cultural critiques by investigating the application of low-tech principles in landscape architecture. The aim is to explore how these principles can bridge the gap between traditional craftsmanship and modern architectural needs, offering solutions that emphasize sustainability, resource efficiency, and cultural preservation. By integrating traditional techniques with passive ecological technologies, the study seeks to reimagine architectural practices that balance functional, aesthetic, and environmental objectives. Ultimately, the research aspires to contribute to the growing discourse on sustainable design, addressing the urgent need for innovative yet contextually grounded approaches to contemporary environmental challenges.

2.0 Literature Review

This critique is based on the paradoxical proposition: "Firstly, the total amount of non-renewable global resources is fixed; secondly, the progress and development of human civilization are inseparable from continuous resource consumption." (Wang, 2003). Although humanity continuously updates resource utilization methods and invents innovative modes of resource use, these efforts merely slow down the reduction of total resource quantity relative to the ultimate resource limits. With the global population around 7.4 billion, quadrupling from 1.8 billion in the 1960s, most non-renewable energy sources are nearing their limits. This has led to reflections on resource utilization technology within paradoxical culture (Zhang, 2016).

Under this proposition, a sub-proposition arises: if the rate of resource consumption slows or achieves negative growth until the Earth's life limit, then such a mode of resource utilization is commendable. This involves sustainable development through resource substitution and low-tech applications to reduce energy consumption rates. Research on low-tech architecture is crucial in addressing this proposition within this paradoxical culture and technology. Low-tech architecture can be summarized on three levels: a) Primitive Architecture Level: Advocates for natural ecology, vernacularization, and passive environmental protection and energy saving. b) Modern Level: Critically negates the consequences of industrialization and the energy consumption of high technology, advocating for the use of proactive low-tech architecture. c) Comprehensive Low-Tech Constructive Thinking Level: Utilizes ecological, energy-saving, and environmental protection technologies—integrating active and passive energy-saving techniques in architecture and innovating technology utilization modes. These three aspects construct the framework of low-tech architecture within humanity's paradoxical cultural and temporal system, ensuring continuous reflective power throughout modernization.

This paper constructs a new dimension of low-tech architectural art from the perspective of "paradox culture" by combining time and space, thereby promoting harmony between nature and humans and ensuring sufficient resource space for the survival and development of humanity in the future. Reflected in architecture's temporal and spatial dimensions, this mainly manifests as the technical thinking between tradition and modernity, globalization and regionalism, humanism, ecologism, and low-tech and high-tech. It aims to correct the ecological relationship between humanity's excessive resource consumption and the sustainable development and utilization of the Earth's limited resources.

The Industrial Revolution accelerated urbanization, hastened the standardization of construction, and led to the design of massive building complexes to accommodate urban economic expansion and capital growth. These developments necessitated extensive urban artificial systems, resulting in a pattern of resource-intensive, energy-intensive, environmentally polluting, and resource-wasting urban energy consumption. Western modern industrialized architectural design principles and highly efficient energy utilization techniques have exacerbated these issues globally. In response to this situation, low-tech architecture emphasizes ecological considerations, focusing on sustainable resource utilization, perpetuity, and harmonious human habitation. This paper examines low-tech architectural art's application prospects and aesthetic values from the perspective of these key themes.

In the context of contemporary economic, cultural, and technological globalization, the application of low-tech architecture demonstrates the following characteristics: diversification of architectural aesthetics, the integration of traditional materials and techniques with regional characteristics, transformation of architectural design methods, and the existence of architecture in the context of counter-urbanization and rural informatization, the influence of consumer culture on architectural aesthetic concepts and the popularization of low-tech architecture, and the shift of architectural design from industrialization towards natural ecological values, gradually constructing the theoretical implications of architectural ethics.

3.0 Methodology

This study aims to investigate the application of low-tech architecture in addressing environmental challenges while preserving cultural heritage and promoting sustainable development. The goal is to develop a theoretical framework and practical strategies that integrate

traditional architectural techniques with modern energy conservation practices. By doing so, the study seeks to bridge the gap between vernacular architectural traditions and the demands of contemporary ecological design.

To achieve these aims, the research employs a structured, multi-phase methodology:

1. Theoretical Exploration: The study expands on the foundational concepts of low-tech architecture, examining its historical, cultural, and philosophical underpinnings. This includes a detailed analysis of the occurrence, development, transformation, and refinement of traditional technical architecture. Separate examinations of Eastern and Western architectural traditions are conducted to identify shared principles and distinct innovations.
2. Reflection and Conceptualization: Building on the theoretical base, the research reflects on the current state of low-tech construction. It explores opportunities for its development and popularization, particularly in the contexts of globalization and post-urbanization. This phase involves sketching a conceptual framework for low-tech architectural design thinking, guided by ecological philosophical principles, to address the increasing urgency of sustainable development.
3. Application Analysis: From the perspective of the global resource crisis, the study critically evaluates the need for low-tech solutions. This involves contrasting the shortcomings of high-tech, resource-intensive methods with the advantages of low-tech approaches, particularly in urban architecture. Case studies are utilized to illustrate the real-world applicability of low-tech design, highlighting its potential to reduce energy consumption and environmental impact.
4. Adaptability and Implementation: The research introduces the concept of adaptability in low-tech architecture, addressing various dimensions such as social, cultural, climatic, and ecological adaptability. This includes designing prototypes for living spaces in rural areas that align with energy conservation and environmental protection goals. Specific methods are tested to evaluate their feasibility, such as employing locally sourced materials, optimizing passive design strategies, and promoting community participation in design processes.
5. Critical Analysis of Trends: The study investigates post-architectural trends and their implications for urban design. Through case studies and examples, it bridges theory and practice, demonstrating the evolution of low-tech architectural concepts in contemporary settings. Key insights are derived to refine the application of low-tech principles in modern contexts.

By combining these phases, the research constructs a comprehensive framework for low-tech architecture that emphasizes adaptability, sustainability, and cultural relevance. The findings aim to provide actionable recommendations for integrating low-tech solutions into urban and rural contexts, ensuring a balance between environmental conservation and architectural innovation.

While this study provides a comprehensive exploration of low-tech architectural principles, it acknowledges several limitations. First, the focus on specific case studies may limit the generalizability of findings across diverse geographical and cultural contexts. Additionally, the reliance on historical data and theoretical models may overlook the practical challenges of implementing low-tech solutions in rapidly urbanizing environments. The study also acknowledges the difficulty of fully integrating low-tech practices in regions with limited access to traditional materials or skilled labor. These limitations highlight the need for further research to address these gaps and refine the proposed strategies for broader applicability.

4.0 Findings

As a product of human labor necessary for survival, architectural art is a carrier of human cultural art and a manifestation of thought, reflecting various stages and regions of human development. This has resulted in the formation of primitive types, typological types, and neo-rationalist architectural cultural studies (Tianjin University Press, 2005). Therefore, the existence of architectural culture is fundamentally based on human activities.

Fig. 1. The examples of architectural culture.
(Source: Pramod, G., 2021)

Since the beginning of human society's development, humanity has always been confined to the cultural models it created or imagined, living in a predetermined cultural world, accepting specific cultural influences, and being shaped by them. In this sense, there is a familiar essence between human subjectivity and cultural subjectivity. The realization of human essence and subjectivity aligns with the creation and development within the cultural world (Sima Yunjie, 993-3). While architectural culture constructs human residential cognition, environmental behavior patterns, and the inheritance and development of buildings and human thought, it also embodies contradictions and irrationalities in its value, significance, and functionality, contributing to the paradox of human values, ideologies, and activities—the "architectural culture paradox." (Wang, 2008). With its economic, social, expansive, technical, and greedy characteristics, this paradox impacts human social development and architectural progress, becoming a central theme in paradox studies. In recent years, ecological architecture (Fig. 2), environmentally friendly buildings, anti-planning (Yu Kongjian, 2009), and environmental protection have reconsidered the architectural culture paradox in planning and design.

However, these titles, embellishments, and gimmicks, which exceed their practical significance, still need to fundamentally curb humanity's path to self-destruction under its cultural model. The key to resolving cultural paradox lies in mobilizing cultural subjectivity and fostering continuous creativity and self-renewal. Creativity, eternally conflicting with traditional forces, through internal cultural reflection, forms responses more suited to the subject's needs, thereby gradually eliminating the negative aspects brought by the cultural paradox (Ernst et al., 2004). Therefore, from the perspective of low-tech in architectural culture under the cultural paradox, it is essential to explore the cultural turning points underlying the phenomena of architectural development amidst rising technology. These turning points reveal the inherent irrationalities in the structure and functionality within the architectural and cultural world, characterized by self-related contradictions and value and significance's chaos and uncertainty, thereby demonstrating diversity and hybridity. It necessitates timely reflection, critique, absorption, restraint, development, and innovation.

Fig. 2. The examples of ecological architecture.
(left) Marco Polo tower – Hamburg, Germany & (right) CopenHill – Copenhagen, Denmark.
(Source: Ansari, K., 2022)

Unlike derivative cultural paradoxes, primal architectural, cultural paradoxes carry the significance of primitive studies and genesis, originating in the natural conditions and social existence when a new culture is created. They are transcendental and inherent paradoxical forms (Guo, 2001). Derivative paradoxical culture continuously integrates with social conditions during its movement and transformation, constructing cultural value and function transformations that lead to counter-movements, aiming to resolve social culture's and technological development's contradictions. The architectural, cultural, and technological paradox synthesizes these two cultural forms. The primal paradox aligns with the ecological essence of human-nature harmony in architecture, being primary and based on natural philosophy, exhibiting passive adaptability; derivative architectural cultural and technological paradoxes align with human development goals and survival demands, showing active development, requiring correction and management when deviating, and deceleration and restraint when excessive.

As in the early development of architecture, humans constructed defensive buildings to withstand various threats from nature. It was at this juncture that the simplest forms of housing emerged. Precise geometry defined human habitation; not a single piece of wood was unstressed or unchanged in shape, and all joints had functional purposes. This approach aimed to maximize efficiency and developed a standardized model for primitive housing. Who can say such humble huts might not be offered to the deity's temple one day? (Le Corbusier, 2011). With the improvement of the ability to conquer and transform nature, architectural aesthetic culture also evolved, incorporating higher levels of technology and resulting in humanistic architectural forms linked with political contexts, emphasizing aesthetics. Beyond practical considerations, humans intended to contemplate events beyond their current dim and chaotic awareness. Various buildings were arranged according to specific concepts, leading to various architectural forms under this cultural paradigm (Le Corbusier, 2011).

Eventually, the process reached a level that engendered social issues, such as the aesthetic and cultural void in architecture brought about by urbanization and industrialization and the contradictory ways technology utilized resources. After the Industrial Revolution, with

the progress of industrialization, urban development, and the proliferation of buildings, humans enjoyed the benefits of civilization while simultaneously encountering incalculable consequences, such as resource depletion, environmental degradation, and air pollution. However, humanity cannot detach itself from the modernized model supported by these resources. The cultures created on the dual basis of natural conditions and social development inherently possess paradoxes that are difficult to overcome. The exploitation of resources and the frenzied pace of construction aim to satisfy human desires for a more luxurious life, which constitutes the primary demand for the continued development of a more "extravagant" lifestyle. This is also where the paradoxes and the contradictory nature of energy consumption brought by architectural technology come into play. Therefore, the universal value of low-tech construction in the context of paradoxical culture is reflected in constructing low-tech architectural art. This value dimension embodies the universal aspiration for building a better human habitat, which includes rational utilization of natural resources, advocating for sustainable development, creating environmentally friendly beautiful homes, and the concept of harmony between humans and nature and harmonious coexistence (Zhang, 2012). In today's society, this translates to reflecting on the current construction misconceptions, guiding the sustainable development philosophy of architectural art and life, and prompting humanity to enter the "environmental protection era."

5.0 Discussion

This paper explores the paradoxes and contradictions inherent in human development from a historical perspective on paradox culture. It highlights a dual meaning: On the one hand, human development is necessary to solve survival problems; on the other hand, it requires the consumption of finite resources to sustain human needs. However, resource development and utilization are limited. Under this premise, the question arises regarding choosing the optimal path for sustainable development, harmonious coexistence, and resource utilization. This includes developing new energy sources and utilizing ecological energy to achieve sustainable energy use. The aim is to construct a theoretical framework for the artistic application of low-tech architecture and seek ultimate theoretical methods for sustainable development in energy-efficient building practices. This is the core issue addressed by this study.

The research constructs a theoretical system of low-tech architectural art development in response to environmental crises, serving as a guide. It integrates architectural technology, concepts, and practical achievements, drawing on historical and contemporary knowledge and tracing roots from geographical, climatic, human, and natural environmental factors. The study investigates low-tech architectural art's construction principles, techniques, methods, and philosophies, critiquing current pseudo-low-tech, pseudo-ecological, energy-saving, and environmentally friendly architectural practices. It establishes a new technical lineage for the development of low-tech architectural art. Furthermore, the study summarizes a systemic theory and value system of the "three views" and "four dimensions" for developing low-tech landscape architectural art under environmental crisis conditions.

6.0 Conclusion and Recommendations

The focus on landscape architecture or vernacular architecture began after modernism, spurred by the ecological awareness triggered by resource crises and its application in architectural design and aesthetics. This interest stems from a critique of high-tech architectural development's high material and energy consumption and an aesthetic critique of homogeneous architectural forms.

Post-Industrial Revolution resource utilization development shows that the energy consumption of buildings and decoration accounts for nearly three-quarters of total social energy consumption. The widespread adoption of high-speed construction and assembly technologies has severely impacted the artistic quality of architecture and undermined its aesthetic aspirations. Ultimately, to curb and reduce these resource utilization methods, we must return to low-tech construction approaches to achieve sustainable development and gradually reduce the rate of energy consumption. This ensures humanity's continuous survival and development while preserving the cultural memory of beautiful architecture for future generations.

We propose constructing new genealogies of low-tech landscape architectural design under environmental crises, encompassing temporal, spatial, cultural, and technological dimensions. This approach promotes the harmonious coexistence of nature and humans, offering new technological design aesthetics for resource utilization, protection, and development for humanity's future survival and development. It provides new pathways for the landscape artistic forms of architectural design. In the spatiotemporal dimensions of architectural art, this is mainly reflected in the temporal dimension of tradition versus modernity, the spatial dimension of globalization versus regionalism, the cultural and artistic dimension of historical inheritance versus contextual innovation, and the technological dimension of traditional versus modern passive low-tech aesthetics. These dimensions offer new perspectives for landscape architecture design education in the new era.

Acknowledgments

Tang Tingqiang, Male, Professor, Dean of the School of Handicraft Art, Shanghai Art & Design Academy, Director of the Craft Art Research Center (Handicraft Art Research Institute).

Paper Contribution to Related Field of Study

The paper promotes low-tech, sustainable design principles, integrates traditional and modern architectural practices, develops new educational systems, establishes regulatory frameworks, and advocates for harmonious coexistence with nature.

References

Ansari, K. (2022). Ecological Architecture. https://archestudy.com/ecological-architecture/

Cassirer, E. (2004). The logic of the humanities (Guan, Z. Y., Trans.). Shanghai: Shanghai Translation Publishing House.

Dai, Z. Z., Yang, Z., & Xiong, W. (2006). Analysis of architectural creation ideas - Ecology and bionics. China Planning Press.

Feng, Y. L. (2004). A short history of Chinese philosophy. Beijing: New World Press.

Guo, W. (2001). Cultural types in history. Journal of Aba Teachers College, Aba.

Hausdorf, H. (2011). (Li, W., & Li, N., Trans.). Nanjing: Jiangsu People's Publishing House.

Koolhaas, R. (2015, June). I am very involved in Chinese history. Tencent Culture Network, Shenzhen.

Le Corbusier. (2011). Research on architectural integrity. Beijing: China Architecture & Building Press.

Meng, R. (2013). Commune under the Great Wall - Bamboo house by Japanese architect Kengo Kuma. Farm Garden Construction, Beijing.

Pramod, G. (2021). 15 Examples of Multi-cultural Architecture around the world. https://www.re-thinkingthefuture.com/designing-for-typologies/a3832-15-examples-of-multi-cultural-architecture-around-the-world/

Research Series on Modern Architectural Trends: Typological Architecture. (2005). Tianjin: Tianjin University Press.

Shen, L. F. (2011). Research on the development path of "low-carbon residential" construction. Proceedings of the Second International Symposium on Artificial Intelligence Management Science and Engineering, Zhengzhou.

Sima, Y. J. (1993). Preface - On cultural subjectivity. Jinan: Shandong People's Publishing House.

Wang, B. (2008). Interpretation of corporal punishment phenomena under paradoxical culture. Beijing: Contemporary Education Science.

Wang, L. J. (2003). General architectural typology (Doctoral dissertation). Tianjin University, Tianjin.

Xia, G. P. (2005). Research on the settlement form of Lingnan architecture (Doctoral dissertation). South China University of Technology, Guangzhou.

Xia, Y. P., Hua, X., & Xia, Y. (2012). Green energy-saving buildings are the direction for human survival and development. Shanghai Building Materials, (3).

Zhang, T. B. (2016, July 12). Beijing Forum. Zhonghua Think Tank, Beijing.

Zhang, W. (2012). The universal value of Yuan Ye theory and its guiding role in building a beautiful China. Chinese Landscape Architecture, (12).

Zhou, J. (2012). The significance and conditions for China to implement the green development strategy. China Green Development Annual Conference, Beijing.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta
https://arcadesa.isi.ac.id/index.html
8th Art, Craft and Design in Southeast Asia International Symposium
ISI Yogyakarta Indonesia, 27-28 September 2024
Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Creation's of Signature Batik from North Sumatra Ethnicity

Wahyu Tri Atmojo

Faculty Language and Art,
State University of Medan, Medan, Indonesia

wahyutriatmojo@unimed.ac.id

Abstract
The creation of batik from 7 tribes in North Sumatra is an effort to preserve diverse cultures. Batik is designed by combining motifs from the seven tribes of Mandailing, Nias, Simalungun, Batak Toba, Dairi, Karo and Malay, which reflect the uniqueness and values of local intelligence in each tribe. The creation process includes in-depth study of traditional motifs, interviews with cultural figures, in-depth exploration of traditional ornaments, selection of meaningful symbols, application of distinctive batik techniques to produce aesthetics and meaning. The result is seven unique batik designs, each reflecting the identity and values of the ethnic culture it represents
Keywords: Batik; create; ethnic

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6162

1.0 Introduction

North Sumatra is one of the most diverse ethnic areas. Located at the northern end of the island of Sumatra. Known for its characteristic Batak tribes from ethnic groups that inhabit most of the territory in some of North Sumatra which are Karo district, Dairi, Simalungun, Asahan, to North Tapanuli. North Sumatra's typical Batic is commonly called Batic Batic, consisting of several ethnic-based motifs that exist in North Sumatra (Astuti, 2019). The typical Batic of North Sumatra has its characteristics and is taken from each tribe that exists in North Sumatra. The Batic motif is adapted to the various ethnic Batic existing in North Sumatera, there are 7 ethnics of North Sumatra, which are Toba Batak, Karo, Pak-Pak, Simalungun, Mandailing, Nias, and Melayu.

Every ethnic group in North Sumatra has different patterns of motif and color, which enriches the meaning and philosophy of motif. The whole pattern of motive and color originated from a thought of the ethnic community as a form of expression of its interaction with nature, man, and God. Batik is a handicraft drawing on a fabric medium for clothing that was one of the cultures of the Indonesian royal family in ancient times. Initially, batik was taught only by the keratin princesses to fill empty activities, so the ornaments that appeared were some sort of decoration that depicted the surroundings of the palace like decorative motifs. Batik Indonesia has been designated as a Masterpiece of the Oral and Intangible Heritage of Humanity by UNESCO since October 2, 2009. As time passed and the ages evolved, the batik was widespread and anyone could wear it. This is proved by the abundance of fund managers and entrepreneurs of batik in various areas of the island of Java that are the livelihoods of the people in improving the local economic well-being (Wahyu,

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6162

2010 and 2012). In addition to Java Island, now batik also grows and extends outside of Java Island, one of them is the City of Medan North Sumatra (Wahyu, 2020).

The shape, color and symbolic meaning of ornaments are standard and agreed by the local community so it requires care and preservation (Mesra, et al.,2022). Ornaments are intended to revive a field of background and give rhythm by repeating the shape of a present and meaningful motif, so that the ornament can arouse a feeling of pleasure in its maker or its creator. (Noor, 2022). The existence of North Sumatra's ethnic motives can provide an opportunity to build a good foundation for creation not only by changing existing ones but in this case also considering the various directions of local absorption aspects. With hope, the emergence of the discovery of creative works with aesthetic elements on the work of batik written referring to 7 ethnicities in North SumatraIn this era, there is a need for more conservation-related innovations, broader development of the batic so that such works of art are not forgotten in an increasingly sophisticated era. Implementation done in a variety of other ways is the creation of a prototype batik 7 ethnic North Sumatra.

This study aims to visually interpret the aesthetic elements of ornaments from North Sumatra's 7 ethnic groups into written batik designs. The research involves collaboration with batik experts and potential long-term users to ensure the sustainability and practical application of the findings. The primary objectives of this research are to adapt and incorporate the aesthetic elements from North Sumatra's 7 ethnic ornaments into the design of written batik prototypes. Evaluate and analyze the aesthetic value of the resulting written batik prototypes. This assessment will focus on how effectively the engineered designs capture and represent the distinctive ornamental features of North Sumatra's 7 ethnic groups.

2.0 Literature Review

A prototype is an original type, shape, or example of something that is used as a typical, basic, or standard example for other things of the same category. In the field of design, a prototype is made before it is developed or specifically made for the developer before being made on a real scale or before being mass-produced. According to Krisyanti in Fakhrurozi (2019), a prototype is the original type, shape, or example of something used as a typical, basic, or standard example for something else of the same category.

Batik is derived from a colouring result which is technically by means of the technique of covering the dust or the strip with a sterile dye (napthol), has the characteristic motif of an ornament characteristic of an ethnicity. In this research will create the art of crafts of batik in it applied ethnic ornaments of North Sumatra. The selection of raw materials used in the manufacture of ethnic batik crafts Batak is a white mori fabric then the other raw material is batik candles or commonly called 'night' as a material that has a function as a color motif agent or color limiting. On batik dyes used are kinds of synthetic dyes such as napthol, indigosol, as well as the use of salt. In general, batik is a fabric that is derived from the colouring results in the technique of slope rintang with the fabric of batik candles, with motifs of typical ornamental patterns. (Sewan Soesanto, 1984).The process of craftsmanship begins with the process of design. Design has a crucial role to play in the implementation of the prototype process of the 7 ethnic North Sumatra batik. Design is a common process in initiating the process of various works of art and broadly covers some of the outcomes of material culture, originating from the light age past time to the future (Edmun Burke Feldman, 1967; Agus Sachari, 1986).

Previous research has looked into this, but it has primarily focused on the process of creating Batak and Malay batik motif designs. One effort to encourage national relations is to develop batik items that combine Batak and Malay batik themes to foster a bond that can strengthen inter-ethnic relations, resulting in the creation of Bhineka Tunggal Ika through art. The evolution of North Sumatra Malay Batak batik motifs refers to the production process that follows textile industry standards and processes (Farihah et al., 2021) The current study focuses not only on the ethnicity of Batak and Malay batik motifs but also on seven North Sumatran tribes and engineering the aesthetic features of ornaments from these ethnicities to be used as material for the construction of written batik prototypes.

3.0 Method

This art*practice-led research* is a research with an applied product research scheme and applied research that has been carried out previously whose outputs are works, models, prototypes, and prototypes that have been tested in an actual environment. Creation research is carried out *with* a special method, which is a structured creation process with certain stages as described by Husen, (2018) in his book entitled Creation Research Methodology.

The creative process uses a specific methodology that consists of several different phases. Preparatory Phase: The researchers conducted a preliminary study of the aesthetic components of ornamental designs from seven ethnic groups in North Sumatra. Conceptualization Stage: In this stage, the researchers explored their creative interpretations of the aesthetic elements of the seven ethnic ornaments. Design Elaboration Stage: This stage focuses on developing the initial concept. The researchers worked to integrate the aesthetic elements of the seven ethnic ornaments, creating a comprehensive and cohesive design. Prototyping Stage: In this final stage, the developed batik design is realized. This process covers the entire batik-making procedure, including the initial wax application (pengecapan), coloring, and wax removal (pelorodan).

Work Testing

Testing the work of the prototype of batik Tulis based on the 7 ethnicities of North Sumatra was carried out by assessing the aesthetic quality by 3 (three) experts. The local cultural resources of North Sumatra's 7 ethnic ornamental aesthetic elements were identified according to certain characteristics in the North Sumatra region. After identification, the next process is classification, namely sorting and selecting the wealth of local cultural resources and their supporting elements. The next process is explication, which provides a

comprehensive explanation of the aesthetic elements of North Sumatra's seven ethnic ornaments by the symbolic meaning contained in them and placed according to their form and function. The next step is to try to create various imaginations and alternative designs. The alternative designs were then selected by the objectives to be achieved. After the design is selected, then experiment with making prototype batik artworks by referring to the design principles.

3.0 Findings

This study includes a sample of prototype batik tulis 7 ethnic North Sumatra items, as well as an assessment method with an assessment committee that will evaluate the job completed.

Figure 1, Mandailing is a combination of ethnic ornaments, some kind of motif that is found in the batik fabric is burangir, which has a philosophical meaning, whether it concerns the execution of customary ceremonies and rituals must first ask for mining and permission to the king and namora na toras (Azhari et al., 2019). Then there is a scale motif that symbolizes the high level of social concern of the King. On the upper and lower sides, there is a Rudang motif that symbolizes a perfect forest. The meaning of the forest means all the attributes of its customary greatness such as customary clothing, uniforms, weapons, and so on. How many colors are produced on the tennis batik cloth is black as the background color, white, red, and yellow color. All motif arrangements are based on structures that have aesthetic value and are easy to organize. The motif is structured in such a way that it forms a design that is applied to the Mori fabric.

Fig 1. Mandailing Batik's
(*Source: Atmojo, W. T., 2024*)

The process of making this aesthetic batik prototype applies design principles to batik. Design principles are ways, techniques, or instructions for applying elements to a design work. The principle of unity is found in clothing motif products. This is between one part and another part is a whole unit, supporting each other and systematically forming an order of various ornamental motifs. The arrangement of objects and components of motif objects is well organized. The balance in this Mandailing basic fabric prototype work looks good, this can be seen in the work with how the layout of motifs is attractive and has the same attention, both the placement of shapes and the resulting color grouping. Rhythm in the work occurs when repeating shapes to colors that are produced regularly but not monotonous, changing or changing size and continuous. Emphasis is the most interesting part, some objects become interesting and appear well. Proportion in Mandailing can be seen from the comparison of the first part with other parts ranging from large to small to wide to make it look good and interesting. Next is harmony where this principle arises because of the similarity and harmony between left and right.

Fig. 2. Nias Batik
(Source: Atmojo, W. T., 2024)

Figure 2, Nias Batik is packaged uniquely and attractively with a touch of merging ornament-ornament typical of Nias. There are some supporting ornaments of the Ni'oafi-afi motif, a picture of a small circle surrounded by leaves in the shape of a lonjong. The motive of Ni'oiozasai symbolizes heroism and is depicted with a red wama. Then the motive Ni'omeme Roto symbolises fertility and, at the same time hope. The Ni'osolafiga that symbolizes the unity and nature of this royong gotong is a sulursuluran-shaped oraramen. The colors that dominate the work are black, red, white, and yellow. Thus, the existence of the application of the design principles to the product of the prototype of the typical batik fabric of Nias does not eliminate the sacred meaning that is found in the typological motif of the tribe of the Nias.

Figure 3, the Simalungun ethnic patch is a combination of several Mandailing ethnic motifs. Consisting of the apple-apple-pine motif, this motif reflects cleanliness, then there is also the suleppat motif. In the embroidery of this typical Simalungun fabric prototype, there are series that are interrelated with each other, resulting in a beautiful and detailed speech. Simalungun ethnic decorative motifs tend to feature repetitive motifs. The motifs are displayed in a form that has been developed but still shows the original form of embodiment. In addition, sometimes the forms of motifs applied to ornaments are displayed in a natural form, so that they still show their original form and the resulting form is not rigid. This application process is inseparable from what is called the principle of design principles.

Fig. 3. Simalungun's Batik
(Source: Atmojo, W. T., 2024)

Fig. 4. Toba's Batik
(Source: Atmojo, W. T., 2024)

Figure 4, Toba Batak ethnic batik cloth featuring a variety of unique motifs. The ethnic batik fabric of Toba Batak features a variety of unique motifs. It consists of a village motif, a motif that resembles the direction of the wind, then there is an eye motif which has the meaning of the life force. As the resulting color is black the background color of the fabric, then there is red, white, and a slight touch of yellow. The process of making the work of this aesthetic product is not independent of the application of the design principles to this batik. A design principle is a way, technique, or clue to apply elements to a design work.

Figure 5, Batik fabric typical ethnic Pak-pak Dairi is a combination of aesthetic elements of various motifs typical of the region. Consisting of the motif of the Ritu flower, the motto of the royal flower that symbolizes the summit of beauty for the women, it also symbolises the beauty for its inhabitants to be liked by others like the scented turmeric flowers as weeds. This motif symbolizes unity and unity/family. Looking from the motif that is dressed together and connected, means that whoever has a home is happy to unite and loves to make friends and have a lot of companionship. On the typical ethnic fabric this Dairi shows some typical colors namely, black, red, white and yellow.

Fig. 5. Dairi's Batik
(Source: Atmojo, W. T., 2024)

Figure 6, This ornamental motif is a related shape of a cloud or a string of clouds that are adjacent to the meaning of the sitelu rack in the Karo society. The top layer of the clouds shows the calambubu and the lower cloud layer as followers which means the boy. The motifs were given the colors of item, red, white, and yellow as a characteristic color of the Karo ethnicity. This aesthetic product is a product that is packaged and developed uniquely. This prototype fabric is made with the Batik writing technique and includes a combination of motifs presented as a characteristic Karo ethnic motif. The process of making the work of this innovative product is not apart from the principles of design on batik. This design principle is one of the ways, techniques, and instructions on how to apply elements to a design work. As for the design principles, they include unity, balance, rhythm, emphasis, proportion, and alignment. This principle is necessary for Karo's ethnic fabric innovation to enable the whole element of principle to become an integral unity, supporting each other and systematically forming a work of art.

Fig. 6. Karo's Batik
(Source: Atmojo, W. T., 2024)

Fig. 7. Melayu's Batik
(Source: Atmojo, W. T., 2024)

Figure 7, The display of the prototype of batik fabric that refers to the Malay ethnicity Deli appears pretty picky, unique and interesting. The combination of some of the aesthetic elements of the Malay tribal motifs became the focus of attention on this batik fabric. It consists of a motif of a spruce, a hooked hook, a flower motif. All motifs are based on structures that have aesthetic value. The motif is structured in such a way that it forms a design that is applied to the Mori fabric. The colors chosen are black, white, green and yellow as the colors typical of Malay ethnicity. The process of making aesthetic prototype product is not apart from the principles of design on batik. This design principle is one of the ways, techniques and instructions on how to apply elements into a design work. As for the design principles, they include unity, balance, rhythm, emphasis, proportion and alignment.

4.0 Discussion

The process of making North Sumatran ethnic batik prototypes requires considerations supported by practitioners in the field and artists. Below is a table of evaluation aspects of prototype batik products from 7 ethnic groups in North Sumatra. The process of making the North Sumatra ethnic batik prototype which refers to the seven tribes of North Sumatra, namely: Mandailing, Nias, Simalungun, Toba, Pak Pak Dairi, Karo and Melayu has been completed. The success of creating written batik works based on seven ethnic motifs can be used as material for appreciation for students and the wider community. The seven ethnic batik produced can also add to the repertoire of batik in Indonesia and internationally. To strengthen and gain public recognition and support for the seven ethnic batik works, opinions are needed through assessment by competent experts. The assessment aspects carried out refer to the work that has been produced. The aspects assessed are the appearance of motif modifications; appearance of motif development; appearance of motif characteristics; the appearance of the neatness of the cutting, the appearance of the coloring results, and the appearance of the work produced by this batik work. Every aspect that was assessed received responses and values that could support the creation of seven ethnic-based batik works in North Sumatra and be further developed with innovative and creative works. A summary and average value of the seven batik works assessed by competent experts is presented in the following table.

Table 1. Overall Assessment Recapitulation Table

Title	Amount	Average
Mandailing's Batik	268,7	89,6
Nias Batik	269,3	89,8
Simalungun's Batik	268,2	89,4
Toba's Batik	266,7	88,9
Dairi's Batik	268,7	89,6
Karo's Batik	269,5	89,8
Melayu's Batik	270	90

(Source: Atmojo, W. T., 2024)

Table 1, it can be concluded that the results of the overall prototype product work on the batik fabric of the 7 ethnic groups of North Sumatra look good. Based on the results of the number of reviews on a product with an average value obtained by Mandailing Batik works obtained a total value of 268.7 with an average value of 89.6. Nias batik works look good with a total score of 269.3 with an average score of 89.8. Furthermore, Simalungun batik works received a total score of 268.2 with an average score of 89.4. Then Toba Batak batik was done with a total score of 266.7 with an average score of 88.9. Dairi batik works with a total score of 268.7 with an average score of 89.6. Karo batik works received a total score of 269.5 with an average score of 89.8 and the last is Malay batik work with a total score of 270 with an average score of 90 well. The seven batik cloth prototype products can already represent the characteristics of the 7 ethnicities of North Sumatra.

5.0 Conclusion and Recommendations

It can be concluded that there are many potential cultural resources such as ornaments that can be used as a source of ideas for batik motifs. The presence of seven prototypes of written batik cloth based on North Sumatra ethnicity is the first step to develop more batik varieties in Indonesia and internationally. North Sumatra and other regions in Indonesia have very diverse cultural resources. These characteristics characterize the products produced. In addition, cultural resources in the form of ornaments also have meaning as an identity that can provide understanding to the wider community as local wisdom. The seven prototypes of written batik works produced were made in 2024; using primisima mori fabric; work size 115 x 250 cm. The existence of these distinctive and unique ornaments can be explored and developed for batik and other craft products.

The prototype of written batik products created is aimed at middle to upper class consumers. The ethnic ornament motifs of North Sumatra are designed to be more realistic and attractive. Through the creation of batik works in this writing technique, it is hoped that it can open new insights that have a broad scope and knowledge as an answer to the application of ornaments that are not only used to decorate a particular object but have wisdom and aesthetic value in the next product produced in accordance with current expectations. The process of creating batik works certainly starts from design to the process of making it a unique and interesting work; both for clothing and for other uses.This research has certain constraints, particularly regarding its timeframe. The prototype examined was created in 2024, which may not fully represent developments before or after this period. For future studies, it is suggested that a long-term investigation be conducted to track the evolution of North Sumatran batik patterns over time. Analyzing batik designs from earlier periods could offer valuable insights into the progression of this traditional art form.

References

Atmojo, W. T., et al. (2023). 'Exploration of Malay Ornament and Serdang Motif in Batik Tulis with Colet Technique', Research Report. LPPM Unimed.

_____. (2023). Cultural Arts Learning Based on Local Wisdom of North Sumatra. Medan: CV Format Publishing.

_____. (2022). 'Innovation Product Batik Batak Based on Ulos Motif by Using Virtual Reality (VR) Media', Research Report. LPPM Unimed.

_____. (2021). Development of Batik Tulis Based on the Aesthetic Value of Batak, Malay, and Nias Traditional Houses with the Use of Digital Visual Elements, Research Report. LPPM Unimed

_____. (2020). Batik Exploration of Local Wisdom: Ornaments of North Sumatra. Medan: CV Kencana Emas Sejahtera.

_____. (2011). 'Batak ethnic art-based souvenirs', Nationally Accredited Journal PANGGUNG: Scientific Journal of Arts & Culture, Vol. 21 N0. 3 July-September 2011, STSI Bandung, pp. 329-339.

_____. (2010). 'Traditional Batak Ornament in Batik Technique', Nationally Accredited Journal PANGGUNG: Scientific Journal of Arts & Culture, Vol.20 N0. 2 April-June 2010, STSI Bandung, pp. 159-168.

_____. (2013). 'Creation of Simalungun Batik', National Accredited Journal of STAGE: Scientific Journal of Arts & Culture, Vol. 23 N0. 1 March 2013, STSI Bandung, pp. 90-97.

_____. et al. (2024). 'Exploration of Malay Ornaments and Serdang Motifs in Hand-Painted Batik Using The Colet Technique', Proceedings of the 5th International Conference on Innovation in Education, Science, and Culture, ICIESC 2023, 24 October 2023, Medan, Indonesia. EAI, DOI 10.4108/eai.24-10-2023.2342142.

Dearma S., Yulianto, & Raimundus. (2019). 'Study of Gorga Ornamentation in Toba Batak Traditional Houses', ALUR Architecture Journal, Vol. 2 No. 1- April 2019, Santo Thomas Catholic University of North Sumatra, pp. 1-14.

Farihah.et al. (2021). The Development of Batak and Malay Batik Motif Stilation in Improving the Creative Industry in Indonesia. RISS Journal , Vol. 2, No. 4. pp 416-427

Feldman, E. B.. (1967). Art as Image and Idea, Englewood Cliffs, New Jersey: Printice-Hall Inc.

Gustami, S. P. (1980). Nukilan Seni Ornament Indonesia, Yogyakarta: Indonesian College of Fine Arts.

Karolina, S., Gunardi, G., Widyonugrahanto, & Rustiya, S. (2015). 'The Meaning of Gorga Carving Art in Batak Traditional Houses', Nationally Accredited Journal PANGGUNG, Vol. 25 No. 3- September 2015, UNPAD Bandung, pp. 227-235.

Mesra, et al. (2022). 'Application of North Sumatra Traditional Ornament on Food Jar as Revitalisation Suggestion', Gorga Journal: Journal of Fine Arts, Vol.11 No. 1 January-June 2022, Medan State University, pp 81-88.

Olivia, Y., & Ramadhan, M. S. (2019). Application of Block Printing Technique with the Inspiration of Gorga Batak Ipon-Ipon. Journal of e-proceeding Art &Design Vo;. No.3 December 2019. Telkom University Bandung, pp. 4172-4177.

Rangkuti, N. et al. (2008), Handbook of Ceramic Analysis, Jakarta: National Archaeological Research and Development Centre.

Ratih, R. (2024). 'Creation of Written Batik Prayer Mat Using Malay Decorative Variety' Sindoro Cendikia Education. Vol. 3 No. 8. pp 36-44.

Saragi, D. (2017). Types of Motifs & Philosophical Values of Aesthetic Elements of North Sumatra Motifs. Yogyakarta: Thafa Media.

Siburian, T. P. (2022). 'Visual Form and Symbolic Meaning'. Journal of Contemporary Indonesian Art, pp. 54-56.

Yedija, et al. (2024) 'Gundala-Gundala as the Basis for the Creation of Batik Tulis'. Junal Cendikia, Vol. No. 6- June 2024, pp. 83-112.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Exploring Cultural Diversity: A comparative study of shell belt craftsmanship in the Hani/Akha Group

Liu Mingquan, Siti Rohaya Yahaya*, Guo Chunli
**Corresponding author*

School of Arts,
Universiti Sains Malaysia, Penang, Malaysia

liumingquan7788@student.usm.my, ysrohaya@usm.my, guochunli@student.usm.my
Tel: +60199559541

Abstract
This article explores the traditional shell belts of the Hani people, focusing on the styles of Loi Mi AKha and U Lo Akha in Southeast Asia and Bi Yue in China. It examines their history, techniques, design, materials, and cultural significance, identifying similarities and differences. The study finds that while the belts share materials and artistic value, they differ significantly in other aspects. These insights underscore the rich diversity of Hani handicrafts and their adaptation to different environments, contributing to the sustainability of ethnic minority crafts.

Keywords: Hani ethnic group; Akha; Shell belts; Culture diversity

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6163

1.0 Introduction

Culture exists in various forms, and the cultures of different countries, nationalities, and times have unique forms, connotations, and characteristics. The Hani or Akha people discussed in this paper represent a diverse existence. Akha and Hani are two very closely related groups. According to incomplete statistics, more than 2 million people are distributed in Yunnan Province of China, Laos, Myanmar, Vietnam, and Thailand (Chen, 2014). Their distribution areas are adjacent, and their cultural customs are similar.

In China, the Hani ethnic group has a population of more than 1 million, most of whom are distributed in the area between the Yuan River and the lower reaches of the Lancang River in Yunnan Province, with the most concentrated distribution in Yuanjiang, Mojiang, Honghe, and Yuanyang counties. Many of these Hani branches are distributed in this area but are generally referred to as the Hani. From Xishuangbanna along the border area to several Southeast Asian countries, many of these groups are regarded by Chinese scholars as Hani or groups closely related to the Hani, also known as Akha people.

Judging from the close relationship between the Akha people and the Hani people, they were differentiated from the Hani people and gradually migrated to these areas where their descendants are distributed today (He, 2012). After environmental changes and the interaction of different societies, it is more appropriate to call them homologous ethnic groups. The Loi Mi Akha, U Lo Akha, and Bi Yue

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6163

Hani discussed in this paper are all branches of this homologous ethnic group. Loi Mi and U Lo are two branches in the Southeast Asian region, found in Thailand and Myanmar. Scholars have many research materials on the Akha people in Thailand; this paper only focuses on this group in Thailand. Most of the Bi Yue live in China, and this paper focuses on the Bi Yue group living within Mojiang Hani Autonomous County, Yunnan Province, China. According to Yang (2011), one of the three migration paths of the Hani/Akha people involved passing through Mojiang Hani Autonomous County to Xishuangbanna, then moving from the border area of Xishuangbanna into Myanmar and subsequently to Laos, Thailand, and other places. Although Thailand was the last place of migration, the history of the Akha people in Thailand has already exceeded 100 years. Despite their complex migrations, they share a common origin and early history as homologous peoples. This is reflected in their culture and living habits. For example, in the use of decorations, they all use a type of seashell called cowrie to adorn their bodies. Yang (1993) pointed out that many ethnic groups worldwide use seashells as a medium for commodity exchange, especially in many countries in Africa and Asia, where shell currency is more common. According to historical records, the Hani people used seashells as currency during the Yuan, Ming, and Qing dynasties. After maintaining their primary livelihood, the Hani people would save and bury the rest underground as a legacy for future generations. Therefore, the Hani people regard shells as treasures and imbue them with the meaning of symbolising wealth and good wishes. The current discovery of the shell belts used by these three branches is not without basis. The Hani/Akha live in different geographical environments and historical backgrounds, leading to diverse developments in their decorative clothing arts. Although they all use shell belts, they exhibit different styles. The study aims to identify similarities and differences in the styles, materials, techniques, and cultural meanings of shell belts used by the Loi Mi Akha, U Lo Akha (Thailand and Myanmar), and Bi Yue Hani (China). The study also aims to understand the role of these belts in preserving the cultural heritage and promoting the sustainability of ethnic minority crafts. This study will further explore the cultural commonalities and diversity of the Hani/Akha.

2.0 Literature Review

Seashells are a significant component of Hani/Akha ornaments because these shellfish were historically used as currency. Although they no longer hold monetary value, shells remain a part of clothing decoration and symbolise wealth, as Bai (2009) detailed. Despite their significance, existing literature often merely mentions shell belts of the Hani/Akha as traditional accessories, with limited focus on their design or craftsmanship (Feng, 2014; Wang, 2011). To bridge this gap, future research should delve into these shell belts' production process, materials, technical details, and skill inheritance. A thorough understanding of these aspects will enhance our comprehension of the cultural traits and technical prowess of the Hani and Akha, assessing the viability and evolution of these crafts in contemporary society. While comparative studies between the Hani and Akha have explored linguistics and anthropology, noting differences in language evolution, cultural exchange, and social structures (Yu, 2009; Sprenger, 2015), the specific analysis of their costumes has been sparse. Most research tends to address broader cultural representations, neglecting detailed exploration of distinct cultural practices like shell belts. It is essential to conduct focused comparative studies on specific subpopulations, such as the Bi Yue subgroup in China and the Loi Mi and U Lo subgroups in Southeast Asia. Such detailed comparisons will more accurately capture these groups' unique cultural expressions and craftsmanship in clothing, thereby contributing to the broader understanding and preservation of diverse traditional cultures. This approach not only enriches ethnic studies but also significantly aids in promoting cultural heritage protection and sustainable development.

3.0 Methodology

3.1 Research Design

This study adopts a comparative case study approach to examine the shell belt craftsmanship of three subgroups of the Hani/Akha people: the Loi Mi Akha and U Lo Akha in Thailand and Myanmar, and the Bi Yue Hani in China. These subgroups were selected due to their shared ethnic roots but varied geographical, historical, and cultural environments. The primary focus of this comparative analysis is on the craftsmanship, materials, and cultural significance of the shell belts. The data for this research was collected through a combination of literature review, fieldwork, and interviews with local artisans and community members. A comparative analysis was conducted to identify both similarities and differences in the shell belt styles of the three subgroups. The comparison focused on several key aspects: Materials, Techniques, and Cultural Significance. The analysis involved categorizing these elements for each subgroup and then systematically comparing them. The results were analyzed qualitatively to identify patterns and variations in the craftsmanship and their cultural implications. This approach highlights how environmental factors, and cross-cultural interactions have shaped the shell belt traditions of the Hani/Akha people.

3.2 Data collection and analysis

3.2.1Thailand: Loi Mi Akha & U Lo Akha

Loi Mi and U Lo are two subgroups of the Akha who live in northern Thailand and Myanmar, and they are originally from Yunnan Province, China. Every nation has a migration history, which tends to be more frequent in earlier periods. The Akha's journey began in the Xishuangbanna Dai Autonomous Prefecture of Yunnan Province, China, moving through the border areas into Myanmar and Laos. From the late 19th century to the early 20th century, some Akha from Myanmar migrated into northern Thailand's mountains and Laos's border areas (Yang, 2011). The Akha first settled in Thailand before the 19th century and continued migrating until the early 1980s. The

first Akha village in Thailand was established in the Phayaphai region near the Burmese border, and by the end of World War II, the Akha population in Thailand was no more than 2,500. Their population tripled over the next four decades (Lewis & Lewis, 1984). Today, approximately 80,000 Akha live in Chiang Rai and Chiang Mai, Thailand (Forbes & Henley, 2012). The Akha have thrived and diversified into different Southeast Asian subgroups, maintaining consistency in most cultural customs but displaying notable differences, especially in costumes. U Lo Akha, who have settled in Thailand for many years, are identified by their pointed headwear, while Loi Mi, named after a mountain in Burma, typically wear flat headwear with a silver plate on the back (Lewis & Lewis, 1984). Their attire includes headdresses, corsets, jacket tops, belts, skirts, and gaiters. Their tops, straight in the front without buttons, often require belts for closure (Figure 2). However, they did not ignore the decorative belt because of its simple practicality; the shell belt is good evidence.

Fig. 1: U Lo & Loi Mi women

Fig. 2: Costumes of U Lo & Loi Mi
(Source: Peoples of the golden triangle: Six tribes in Thailand)

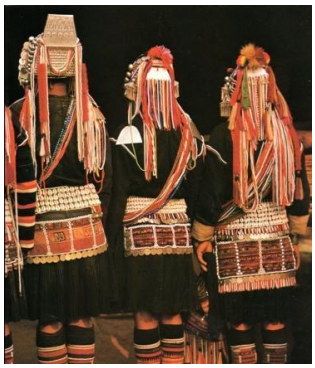
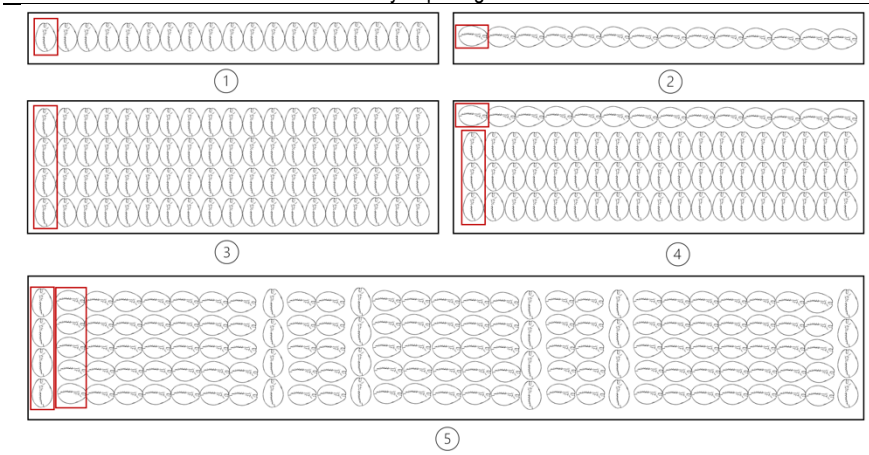


Fig. 3: Shell belts of U Lo & Loi Mi

Loi Mi and U Lo share similar techniques in crafting shell belts, typically sewing seashells onto fabric belts, often alongside Job's tears and silver pieces, with strings at both ends for easy tying. The belts vary in width and length, with unmarried young women typically featuring more shells, perhaps symbolizing or signalling a change in status as per Akha tradition. The seashell they used was cowrie (Yang, 2021), which was used as shell currency. Many materials have confirmed the use of shell currency in Hani nationality. Even with the emergence of new currency circulation, the seashell was regarded as a symbol of wealth, so they could not give it up. Through literature and video data, it is observed that the layout of seashells on the belt is modular in the form of paving, with single or multiple seashells as the basic unit. This modular design allows the same seashells to be repeated on the entire shell belt, creating an orderly and rhythmical visual effect. It can be arranged in various ways, either vertically or horizontally, and this variation allows the design to be flexible and adaptable to different widths and lengths of belts. The longitudinal arrangement emphasizes the fluency and depth of the belt. In contrast, the lateral arrangement highlights its width and stability, and the two-way combination enhances the movement, making the belt look more lively and visually attractive. While the basic units may be the same, a rich visual variation can be created by adjusting the arrangement of the angles or number combinations between seashells. This design is beautiful and reflects the craftsman's delicate control of detail. The natural form and texture of the seashell itself add a unique aesthetic to the belt. The light reflected by the shell's natural curves and gloss adds layers and depth to the decoration, making the entire belt look more artistic and dynamic (Figure 4). As can be seen from Figure 2, there are rich decorative forms of seashells on the belt, which can be summarised into five paving forms: single-paving longitudinal, single-paving horizontal, multi-paving in the same direction, multi-paving bidirectional ribbon, and multi-paving bidirectional block (Table 1).

Table 1. Summary of paving forms on shell belts



1	single-paving longitudinal	Moving to the right with a single seashell longitudinally
2	single-paving horizontal	Moving to the right with a single seashell horizontally

3	multi- paving in the same direction	Take all the longitudinal seashells in the first column and shift to the right.
4	multi-paving bidirectional ribbon	Taking the horizontal and longitudinal seashell of the first column as the unit to move to the right
5	multi-paving bidirectional block	Taking the longitudinal and horizontal seashells as the units and moving to the right according to the law

(Source: Table created by author)

3.2.2 China: Bi Yue Hani

The Hani people live in Yunnan Province, and Bi yue is a branch of the Hani people in China. It is mainly distributed in Mojiang, Zhenshen, and Jiangcheng areas, and a few are distributed in Luchun (Bai, 2005). The shell belt found in the Bi Yue branch in this paper is from Mojiang Hani Autonomous County, Yunnan Province, founded on November 28, 1979; it is the only Hani autonomous county in China and the most concentrated Hani population area. Mojiang is known as the "home of the Hani people" because the county has nine different branches of the Hani people, including Ka Duo, Bi Yue, Ka Bie, Bai Hong, Mi La, Xi Moluo, Hao Ni, A Mu, and Qie Di (Li, 2016). The nine branches are distributed in different villages in Mojiang County and often mix, with distinct differences in language and customs, much like the Loi Mi Akha and U Lo Akha in Thailand. According to the distribution area and the migration history of the Hani people, the researchers found that this migration route was the route that migrated south to Xishuangbanna and then to Southeast Asia, which seems to be related to the shell belt of the Loi Mi and U Lo subgroups. Bi Yue's costumes have a big difference in shape and form from the two subgroups mentioned above: the long dress type (Figure 4), including headwear, blouse, belt, waist, and long dress. Researchers have been to Mojiang County for several field investigations, during which they accidentally found in the Bi Yue community, in the Bi Yue branch, the use of cotton thread by string, braid, and winding of the shell woven into an adjustable and detachable belt (Liu, 2024). However, shell belts are no longer standard, partly because of the complexity of their manufacture and the decreasing number of people who know how to make them, and partly because the seashells used to make shell belts are not easy to obtain, and like Loi Mi and U Lo in Southeast Asia, they are made of shell currency with a cut top. Although many plastic shells have appeared on the market, Bi Yue people think plastic shells are "fake". Through an interview with Li Baitai, a Biyue native, I learned that "real" shells have "medicinal value" in the local area. Take a shell off the belt and soak it in vinegar until the shell is dissolved. Then, take it to treat kidney calculi. Researchers have not studied whether it is effective, but Biyue people are convinced of it, giving the shell belt more local cultural significance. Wise weavers skillfully weave the scattered shell currency they find into a belt, tie them around their waist, and dress themselves up with their unique aesthetic craftsmanship.

Compared to Loi Mi and U Lo's paved shell belts, Bi Yue's is a braided shell belt (Figure 5). Usually, they will use about 60-80 seashells to make a belt. First, use a long cotton thread ‘a’ to thread all the seashells and fold them in half from the middle to ensure that the number of seashells on both sides is the same, and the pointed ends are opposite. Fix the long cotton thread folded in half on a stick made of a tree trunk to form tension. Then, fix one end of the long cotton thread ‘b’ on the stick and all the seashells together by winding. After fixing all the seashells, braid the long cotton threads ‘a’ and ‘b’ together. Use long cotton thread ‘c’ to fix the edge of the waistband on the other side of the seashell according to the method of overlocking in embroidery. This braiding method makes the shell belt practical and detachable, and the number of seashells can be increased or decreased according to the needs (Figure 6).

Fig. 4: Bi Yue women

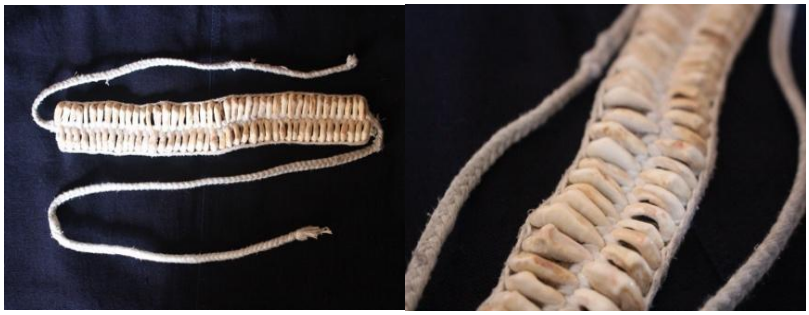


Fig. 5: Shell Belt from Bi Yue

(Source: Figure created by author)

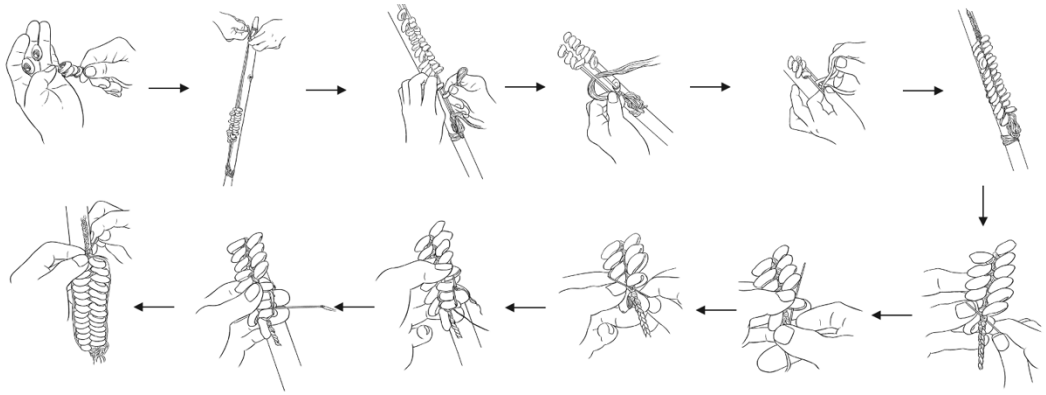


Fig. 6: Bi Yue Shell Belt Hand-drawn process
(Source: Figure created by author)

Biyue's shell belt is made of stringing shells one by one with a cotton thread and reinforcing them with braiding technology. This belt has high structural strength. This production method not only ensures the stability of the shell but also gives the belt itself a richer texture and layering. The production of this belt requires exquisite handicraft skills, including precise shell selection, threading, and a complex braiding process. This reflects the craftsman's high control ability over material processing and detail creation. The braided cotton thread combines with the natural shells to create a unique visual and tactile experience. The shell's natural sheen contrasts with the cotton thread's soft texture, adding to the aesthetic and tactile layers of the whole piece.

3.3 Limitation

The limitations of this study include the focus on only three Hani/Akha subgroups, excluding others; limited historical data on shell belts, with some traditional techniques potentially lost over time; restricted access to artisans, limiting the understanding of regional differences; and the inherent subjectivity in the comparative analysis, which may involve cultural bias. Additionally, the influence of modern technology and materials on traditional craftsmanship was not deeply explored.

4.0 Discussion

4.1 History and Culture

Similarities: Bi Yue in Mojiang County, China, and Loi Mi and U Lo in northern Thailand, despite being spread across different geographical areas, can be traced back to the same roots. This common heritage is reflected in shared origins, early historical narratives, and enduring cultural and customary practices that transcend geographical isolation. Initially, these groups belonged to the broader Hani ethnic group, and over the centuries, they continued to migrate to various regions in China's Yunnan Province and Southeast Asia. Migration, often driven by the need for arable land and political stability, led to different subgroups settling in different regions, from Yunnan Province in China to the mountainous areas of northern Thailand. Despite being physically separated, these groups retain a core set of cultural beliefs and customs, highlighting their common origins. In particular, the textile arts, especially natural dyes and traditional weaving techniques, are critical cultural products of Bi Yue, Loi Mi, and U Lo. These textiles are often decorated with culturally significant motifs and symbols for everyday wear and ceremonial clothing, representing their identity and heritage. Their ability to maintain and adapt their cultural practices despite the separation of national borders underscores their strong cultural identity. These cultural similarities highlight the deep connections that bind these communities across time and space, providing them with a shared sense of identity and belonging.

Differences: Despite the Akha people having more than 100 years of history in Thailand, they show traces of Thai culture in all aspects of life, creating unique characteristics of Thai-Akha culture. These differences are distinct from the local Chinese Hani culture, which is deeply influenced by Chinese Han culture. Specifically, differences are evident in living habits, ideology, and language use (Eduo, 2011). Another notable difference observed during this study is their views on twins. Mojiang County in China is the most concentrated area of Hani people and has the highest birth rate of twins globally. This cultural phenomenon is a source of pride for the local Hani people, and even the name of the knot made by finger knitting technology on the Biyue headdress is called the "twin knot." However, in Thai Akha culture, the existence of twins is considered ominous. People around them often criticise women who give birth to twins. This represents a significant cultural difference between the two groups.

4.2 Materials and Technology

Similarities: In terms of materials, the shells used by these groups were seashells that had previously been used as money. These shells, often chosen for their durability, natural beauty, and cultural significance, serve as the main decorative element of the belts, symbolising fertility or wealth.

Differences: The differences in shell belts used by Bi Yue in Mojiang County, China, and Loi Mi and U Lo in northern Thailand are mainly reflected in style, decoration technology, and craftsmanship. In terms of decorative techniques, the shell belts of Loi Mi and U Lo may incorporate other decorative elements, such as coix seed or silver flakes, influenced by the broader Southeast Asian decorative

arts. In contrast, Bi Yue may favour a more direct and rustic style that emphasises the natural beauty of the shells without additional decoration. In terms of process technology, the distinct technological processes have created two completely different shell belt styles. The paved shell belt by Loi Mi and U Lo highlights modular paving forms, flexible arrangements, natural aesthetics, and dynamic beauty. Bi Yue's braided shell belt emphasises stable structural strength, a detachable design, hand-braided elements, and the layered beauty of material texture.

4.3 Cultural Inheritance and Modern Application

The shell belts of all branches are cultural heritage worthy of protection, recording clues of their shared origins and embodying their wisdom and aesthetics. Despite differences in style, they all have significant modern application value. The paved shell belt can leverage its flexibility in decorative form. Combined with the pattern design on Hani/Akha clothing, the arrangement and composition of different shell units can be adjusted, improving the traditional linear composition and enhancing decorative potential. This decoration can be used not only on belts but also on any item that can be decorated. With its more stable structure, the braided shell belt can highlight its practical function and break down functional barriers, allowing it to be used in waist designs, neck ornaments, wrist ornaments, and more. Expanding the finger-braided process in the original shell belt technique can realise more design possibilities and applications in various aspects of life.

5.0 Conclusion

A comparison of shell belts from Loi Mi, U Lo in Thailand, and Bi Yue in China reveals a fascinating intersection of shared heritage and unique cultural evolution within these branches of homologous ethnic groups. This shared heritage establishes a baseline of cultural and historical elements that persist in their craft traditions. They consistently use shells and belts to symbolise cultural identity and decoration, emphasising the shared cultural value of preserving traditional forms and materials. The belts' craftsmanship characteristics and aesthetic expressions are the most significant differences. A comparative analysis of Loi Mi, U Lo, and Biyue's shell belts highlights the richness of cultural diversity among Hani descendants and demonstrates the dynamic nature of traditional craftsmanship. These belts are not static artefacts but vivid representations of their people's historical, environmental, and artistic evolution. This study underscores the importance of preserving culture in an increasingly globalised world and the role of traditional handicrafts in maintaining and disseminating cultural identity. This not only enriches existing ethnic research but is also significant for promoting the protection and inheritance of cultural heritage.

In conclusion, this study provides a valuable contribution by offering a comparative analysis of shell belt craftsmanship among different Hani/Akha subgroups, shedding light on their cultural diversity and craftsmanship evolution. In retrospective, the comparative methodology used in this research proves to be effective for exploring cultural and craftsmanship differences across ethnic groups, and similar methodologies should be applied in future studies of other traditional handicrafts. However, future research could improve by expanding the geographical scope to include more subgroups, and by incorporating modern influences on traditional crafts. Additionally, further studies could focus on the preservation of endangered techniques and explore the integration of contemporary materials and methods in the evolution of ethnic minority handicrafts.

Reference

Bai, Y. F. (2009). *Historical memory in the costume culture of the Hani people* [Doctoral dissertation, Central University for Nationalities].

Chen, Y. (2014). Review and reflection on the migration research of the Hani people. *Ideological Front, 40*(5), 72–78.

Eduo. (2011). A comparative study of the cultural differences and similarities between the Hani Akha people of China and Thailand. *Journal of Honghe University*, 9(3), 5–8.

Feng, Y. Z. (2017). *Study on the wedding attire of the Hani Akha people in Xishuangbanna* [Master's thesis, Yunnan Arts University].

He, P. (2012). The Akha people in the Yunnan border area and neighbouring countries and their historical and cultural relations with the Hani people. *Journal of Central University for Nationalities: Philosophy and Social Sciences Edition*, (5), 44-49.

Jin-zhi, Y. (2009). The Use of the Mother Tongue by the Akha People of Vavee-Township in Thailand: A Comparison of the Use of the Mother Tongue by the Hani People in China. *Journal of Yunnan Normal University*.

Lewis, P. W., & Lewis, E. (1984). Peoples of the golden triangle: Six tribes in Thailand. *(No Title)*.

Li, L. X. (2016). A preliminary analysis of the value of Hani costumes: A case study of Hani costumes in Mojiang Hani Autonomous County, Pu'er City, Yunnan Province. *China National Expo*, (3), pp. 28–31.

Liu, M. Q. (in press). Preserving Mojiang Hani Hand Weaving Techniques: Understanding Complexity for Culture and Sustainable Development. *Paper Asia*,40(4b)71-83

Mai, C. (2015). Chiang Mai.

Sprenger, G. (2015). Space and the Production of Cultural Difference among the Akha Prior to Globalization: Channeling the FIow of Life by Deborah Tooker (review). *Sojourn*, pp. 30, 576–578.

Wang, X. H. (2011). *Study on the ornament art of the Jingpaw Akha people in Menglian County* [Master's thesis, Kunming University of Science and Technology].

Yang, B. (2021). Once As Money: Cowrie Shells that Made Our World. *Detours: Social Science Education Research Journal*, *2*(1), 52–54.

Yang, L. J. (2011). Exploration of the historical origins of the international Hani/Akha. *Journal of Honghe University*, 9(6), 1–5.

Yang, S. C. (1993). The shell currency culture of the Hani people. *Ideological Front*, 19(3), 45–50.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Harmonizing Local and Global Wisdom in the Design of Environmentally Friendly, Fashionable, and Sustainable Craft Products

Husen Hendriyana*, Khairul Mustaqin, Didik Desanto, Widodo
**Corresponding Author*

Craft Study Program, Faculty of Fine Arts and Design,
Indonesian Institute of Arts and Culture Bandung, Bandung, Indonesia

*husenkriyadesain@gmail.com; khairulmust@gmail.com; di2k212@gmail.com; matawayang.international@gmail.com.
Tel: +62 818-639-395

Abstract
This research provides practical insights into integrating local wisdom, a traditional knowledge and cultural practice repository, with global innovation in creating sustainable, fashionable, and environmentally friendly craft product designs. It investigates adapting traditional techniques and materials to meet the demands of the modern market while preserving cultural and ecological values. It underscores the importance of collaboration between local artisans, designers, and global stakeholders to collective action in achieving sustainability goals. The resulting craft products meet fashion and functionality standards and contribute to cultural and environmental preservation. They outdo expectations, effectively conveying sustainability messages and local wisdom and boosting global appeal.

Keywords: Local wisdom; craft product design; environmentally friendly; sustainable

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6149

1.0 Introduction

In today's globalized world, sustainability has become a pivotal concern across various domains, particularly within the creative industries and craft product design (Anderson & Patterson, 2022). The rich tapestry of Indonesian craft design, rooted in the country's diverse cultural heritage, presents significant potential for growth by integrating local wisdom with global innovation. However, a critical challenge lies in balancing the authenticity of local traditions and addressing the demands of an international market that increasingly prioritizes environmental sustainability (Thorpe, 2021; Polak, 2020).

Local wisdom embodies traditional knowledge and cultural practices developed over generations, often reflecting a harmonious relationship between communities and their natural surroundings (Yu, 2021). This wisdom includes using Indigenous materials, environmentally conscious production techniques, and designs harmonizing aesthetics with functionality. Conversely, global creative and craft design trends increasingly stress the importance of sustainable materials, ethical production processes, and products that seamlessly blend high aesthetic value with practical use (Yair & Schwarz, 2023).

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6149

The fusion of local wisdom with global innovation can yield craft product designs that are visually striking and environmentally sustainable. Such designs can connect traditional cultures with contemporary market demands, fostering environmental conservation while enhancing the socio-economic conditions of local communities (Zafirovski, 2022). This integration encourages the emergence of products that resonate with consumers' growing desire for ethically produced goods that respect cultural heritage.

This article is part of a research project conducted by Hendriyana in 2024, titled *"Modifikasi Desain dan Teknik Produk Kreatif Seni Kriya berbahan alam: Implikasinya pada Produk Ekspor" (Modification of Design and Techniques for Creative Craft Products Using Natural Materials: Implications for Export).* The study identifies and utilizes natural materials abundant in Pangandaran Regency, such as coconut frond sheets and pandan leaves. This coastal region is rich in coconut palms and Pandanus tectorius trees, providing ample resources for sustainable craft production.

The research delves into methods for integrating local wisdom with global innovations in craft product design. Through case studies and a detailed analysis of design practices, this paper demonstrates how combining local and international elements can lead to the creation of stylish, sustainable craft products. Additionally, it underscores the significance of collaboration among local artisans, designers, and global stakeholders, which is crucial for successfully implementing these designs.

Continuing the exploration of Indonesian craft design, it's crucial to highlight the role of cultural identity in shaping sustainable practices. Craft products are not merely commodities; they embody local communities' narratives, values, and skills. These aspects are essential for fostering a sense of belonging and continuity in a rapidly changing world (Fischer, 2022). By infusing craft products with cultural significance, designers can create offerings that resonate with consumers seeking authenticity in their purchases (Klein, 2023).

2.0 Literature Review

The intersection of local traditions and global trends in the design of environmentally friendly and sustainable craft products presents a unique opportunity to create items that are not only fashionable but also culturally rich and ecologically sound. This literature review explores vital themes in the research, highlighting the importance of integrating local wisdom with global practices to achieve sustainability in the craft sector.

1. Browse library reviews related to the Local Wisdom in Craft Design theme.

   Local wisdom, encompassing traditional knowledge, cultural practices, and indigenous techniques, is crucial in sustainable craft design. According to Simpson (2022), local artisans often utilize readily available materials in their environment, fostering a sense of community and cultural identity. This practice preserves traditional Craftsmanship and supports ecological sustainability (Mason & Wilson, 2023; Garcia, 2021).

2. Previous literature related to Global Trends in Sustainable Design, eco-design, and technology

   Global awareness of environmental issues has prompted a shift in consumer preferences towards sustainable products. The rise of eco-fashion demonstrates a growing demand for items that align with ethical consumption (Fletcher, 2020). Research by Fletcher and Grose (2012) outlines how brands increasingly adopt sustainable practices, integrating ethical sourcing, fair trade, and eco-friendly materials. This dual approach can create hybrid products that appeal to local and global markets (McCullough, 2023). For instance, using computer-aided design (CAD) or laser burning in crafting can improve precision and efficiency, reducing material waste (Rosa, 2023).

3. Previous literature related to Case Studies of the Harmonisation of eco-friendly and fashionable

   Several case studies illustrate successful local and global wisdom integration in sustainable craft design. For instance, the Eco-Design Initiative in Thailand showcases how local artisans utilize traditional weaving techniques combined with contemporary designs to create marketable products that reflect cultural heritage and global trends (Rattanakhamhaeng et al., 2021).

4. Previous literature related to Challenges and Opportunities

   The challenges and opportunities of natural craft products include several things that should be able to support the value, function, and meaning of the product, namely:

   a. Sustainable availability of raw materials: Sustainability is a central theme in craft design discourse.
      Yadav and Lee (2023) define sustainability as meeting present needs without compromising the ability of future generations to meet theirs.
   b. Creativity in the design of natural material craft products education for the community
      Müller (2022) emphasizes the role of education and capacity building in promoting sustainable practices among artisans. Workshops on eco-friendly techniques empower local craftsmen to innovate while staying true to their cultural roots, facilitating a fusion of local and global knowledge in production.
   c. Environmentally-based processing systems and Development of production systems involving technological devices
      Fajar and Yulianto (2023) emphasize implementing simple mechanical tools to improve accuracy and production timelines in the handicraft industry. Prabowo (2023) further underscores the significance of adapting technology to boost capacity and effectiveness among local craftsmen.
   d. Collaboration Among Stakeholders to the Marketing System.
      Cohen (2023) suggests that sharing the narratives behind materials, processes, and cultural significance fosters a deeper connection between artisans and consumers. This narrative approach elevates the product and raises awareness about the importance of cultural preservation and environmental responsibility.

Collaboration between local governments, NGOs, and private sector partners is vital for supporting sustainable craft initiatives. Thompson and Thomas (2023) argue that such partnerships can facilitate access to markets and resources, enabling artisans to thrive. By working together, these stakeholders can create a supportive ecosystem that nurtures local craft industries, ensuring they contribute meaningfully to cultural and environmental sustainability.

3.0 Methodology

The design thinking method is used with the Participatory Action Research (PAR) design in this craft and design research (Swann, 2021). Participation research focuses on the concept of participation. This research model involves research partners with a focus on community involvement in research activities; in the field, it necessitates the direct active participation of the pandanus craft group to collaborate in creating more valuable pandanus application products (Buchanan, 2022).

The study population consists of *pandanus tectorius* plants and pandanus craftsmen in fourteen villages spread across a 44.85 km stretch of Pangandaran's 91 km coastline. This study aims to create an eco-design product using natural materials from Pandanus tectorius. The research analysis instrument employs several relevant elements related to other sciences, such as art, design, management, economics, socio-cultural, community motivation, and the environment. The Design Thinking model considers relevant conceptions during the practice-led research stage. The method chart (Fig. 01) aids in explaining the interpretation of arts and crafts to realize the results of the objectives of this research is necessary through the following approaches: *Natural resource development, Social-environmental activism, Human resource development, Economic-environmental activism*, *Eco branding / Geen branding*, and *Technology's Potential Resource.*

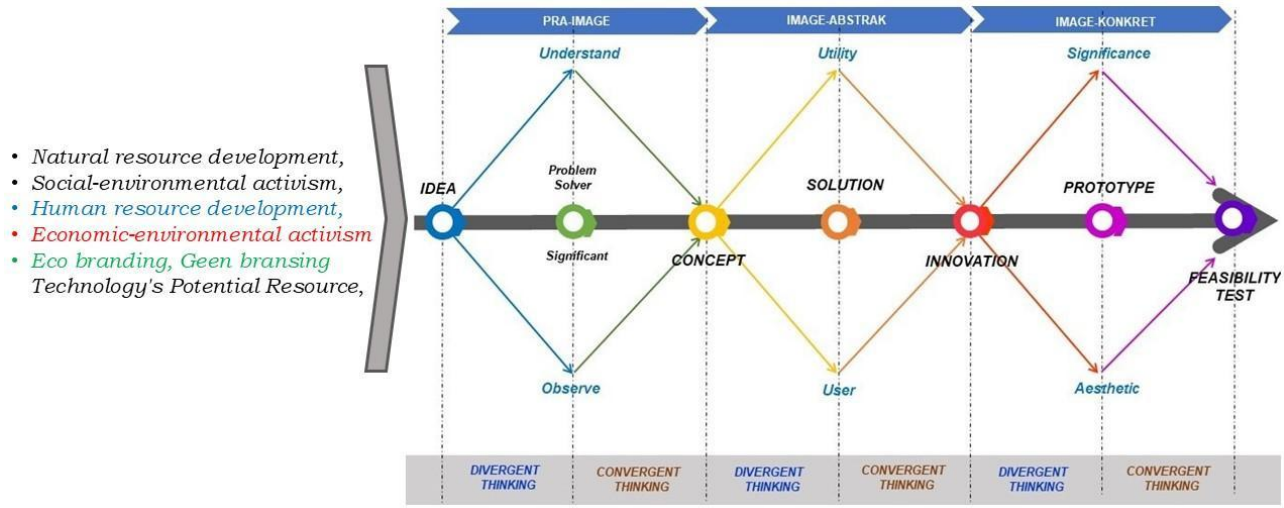


Fig. 1: Design Thinking Method with Five Approach

1. Primary research, understanding, and observing: at this stage, a study of ideas and objects of study that have significant value is then positioned to function as a problem solver.
2. The natural material craft products concept is formulated according to the research's problem, purpose, and benefits.
3. Identification of research instruments leads to the focus of activities and actions, tracing the study of the value of product usefulness and the right users, as well as a solution to the fundamental problems of the results of the primary research study.
4. Identifying supporting elements for the creation of creative and innovative works that provide added value and benefits for society in a broad context involves approaches such as natural resource development, social-environmental activism, human resource development, economic-environmental activism, eco-branding/green branding, and leveraging technology's potential resources.
5. Prototype products are a result of craftwork that not only has aesthetic value but also has broad meaning for other sectors.
6. Products that have the feasibility of various components of value, function, and meaning in the context of "Harmonising Local and Global Wisdom in the Design of Environmentally Friendly, Fashionable, and Sustainable Craft Products".

4.0 Findings

The application of cultural products "Hasta Cipta Preneurship" refers to the Development of a business or entrepreneurship that focuses on products that come from the cultural heritage of a region or community. The concept combines creativity, innovation, and sustainability to create economic value while preserving culture.

Eight Key Elements of Cultural Product Preneurship:

1. People, *preneurship* actors of cultural products

2. Idea, a *preneurship* actor of cultural products who has creative and innovative ideas
3. Humanism refers to an approach that emphasizes human values, ethics, and interpersonal relationships when creating and distributing cultural products. With a humanist approach, cultural products are seen as commercial goods and a means to build identity, strengthen communities, and create broader social awareness. This makes cultural products more than objects; they reflect the human experience and uphold values.
4. Support in cultural products refers to various forms of support that assist in developing, preserving, and distributing cultural products. This includes support from the community, government, and the private sector, as well as elements of education and marketing. Support for cultural products is not only about assisting but also about creating mutually beneficial networks to preserve and promote cultural heritage
5. Reproduction is not only about physical reproduction but also about the values contained in the cultural product. Reproduction generally refers to reproducing, maintaining, and disseminating existing cultural elements, including arts, crafts, traditions, and other cultural practices.
6. Venue, in the context of cultural products, refers to a location or place where cultural products are exhibited, produced, or performed. Venues are essential in the artistic experience and people's interaction with the product. A venue is a place and an essential element that can strengthen interaction and appreciation of cultural products.
7. Market and Marketing
   Today's consumers are more conscious of their choices' environmental and social impacts. They are looking for products that function well and look good, carry a meaningful story, and contribute positively to the world. Craft products that blend local traditions with global trends offer this unique value. The industry should take note of this shift and adjust its marketing and design strategies to meet the growing demand.
8. Product refers to goods, services, or experiences from a culture's values, traditions, and creativity. Cultural products include many forms, including arts, crafts, food, and rituals, which have a particular meaning and significance for the communities that produce them.

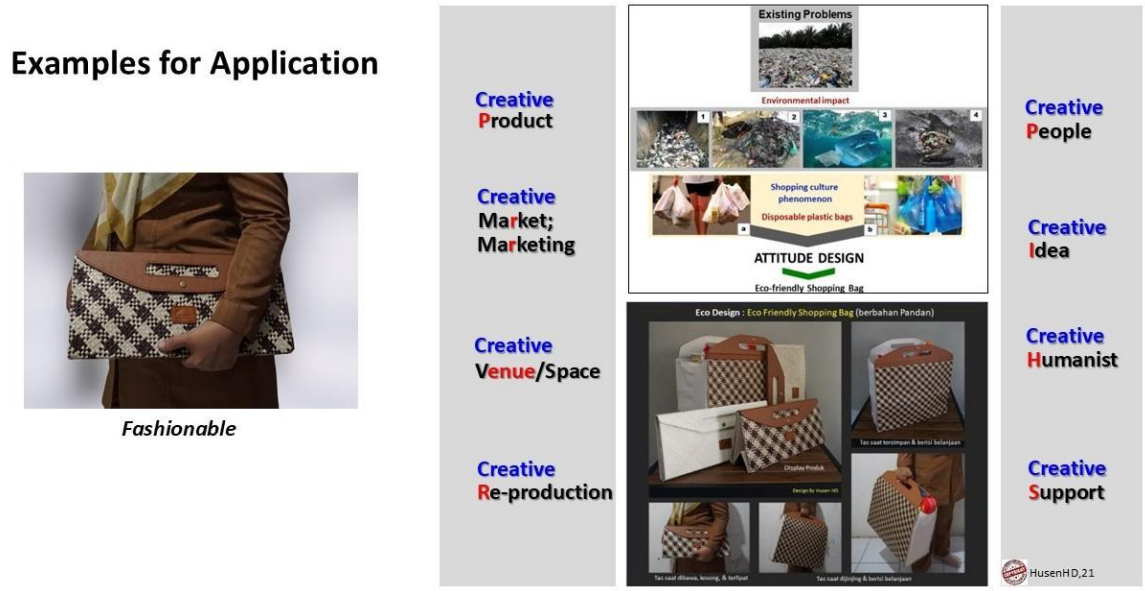


Figure 02: An example of the application of the "Hasta Cipta Preneurship" concept

5.0 Discussion

From the focus of the discussion description in this article, the author conveys more about the implementation and application of Natural resource development, Social-environmental activism, Human resource development, Economic-environmental activism, Eco branding / Geen branding, and Technology's Potential Resource through the application of pandan woven material craft products. With product examples, local and global wisdom will be realized in the craft industry. So far, craft products have always been positioned in traditional, local, and underdeveloped areas. Therefore, this article discusses the other side of the theoretical thing about the guiding elements of "*Hasta Cipta Preneurship*" namely more on the benefits of the use of natural materials, increasing the knowledge and skills of craftsmen related to design and Craftsmanship, the impact on the environment, the potential of the global market with issues of waste, leisure and the environment.

5.1 Cultural Preservation and Innovation

Blending local and global elements effectively shows how cultural preservation can be achieved through innovation. By integrating traditional techniques and materials into modern designs artisans can produce unique items that honor cultural heritage while appealing

to contemporary tastes This method helps keep traditional crafts relevant in a globalized world (Rogers & Smith, 2024; Fernandez & Liu, 2021).

Preservation of traditional culture with coloring techniques with natural color materials from types of leaves and stems such as Daun Ketapang, Tegeran, Tingi dan Secang.

Fig. 3: Preservation of Culture with Natural Dyes
(Source: Photo by Evie Azizah, 2024)

Focusing on local materials promotes sustainability and reduces dependence on imported industrial materials that can harm the environment. Materials like natural fibers, *pandan, mendong*, bamboo, and natural dyes are sustainable and generally better for consumers' health and the environment. Adopting these methods helps reduce waste and boost energy efficiency in production, aligning with global sustainability goals (Fry, 2009; Harris & Turner, 2024).

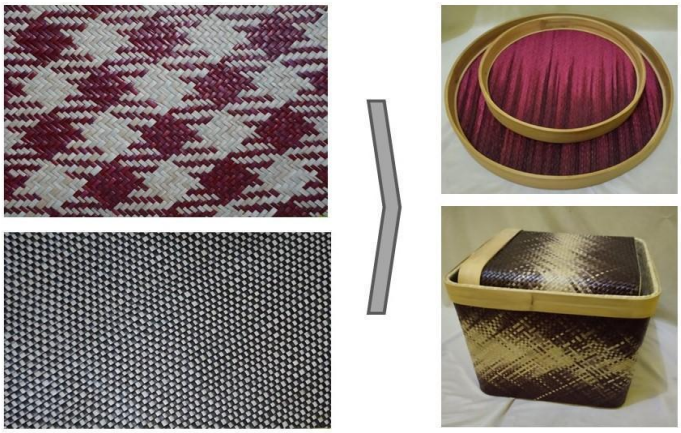


Fig. 4: Preservation of Pandan Weaving Through Innovative Patterns (Abstract Motifs) and Material Combinations (*Pandan, Mendong/Fimbristylis umbellaris*, and Bamboo)
(Source: Photo by Evie Azizah, 2024)

5.2 Sustainability and Environmental Friendliness

The principles of sustainability and positive environmental impact can be achieved through a) using locally available materials through intercropping methods; b) production processes that generate minimal waste; c) simple processes that do not involve air-polluting machinery; d) and degradable materials that break down naturally when the product is no longer in use (Harris & Giannoulis, 2022).

5.3 Integration of Local and Global Elements for Fashionable Products

The study demonstrates that blending local wisdom, such as traditional crafts and native materials, with global design trends can create products that preserve cultural heritage and appeal to contemporary markets (Norman, 2020). This integration requires a careful and thoughtful approach, where traditional values are upheld while incorporating relevant innovations from global trends. For instance, conventional weaving techniques can be adapted to create more modern patterns that align with global tastes (Chen & Burns, 2021; Fletcher, 2020). This approach shows that sustainable design does not have to sacrifice modern aesthetics or functionality. Instead, it can enhance products by adding richer stories and deeper values (Armstrong & LeHew, 2020).

5.4 Community Empowerment

Empowering local communities through sustainable design has a twofold impact. It improves artisans' livelihoods by giving them access to larger markets and adding value to their products. At the same time, it supports cultural preservation by keeping traditional practices alive and relevant. Artisans can adapt to modern market demands by providing training and education while preserving their cultural identity. This sustainability model addresses not just environmental concerns but also social and cultural aspects.

5.5 Environmental Impact, Economic and Social Impacts

One of the primary keys to production sustainability, namely the sustainable availability of raw product materials, is to obtain the availability of raw materials sustainably, which is carried out through intercropping. This will undoubtedly have an impact on the preservation of the natural environment, as well as add economic value for pandan farmers.

Through the participation of the local community, the farmer community, and pandan artisans, namely by planting and processing raw materials for Padanus leaves, it has been able to provide results as a sustainable provider of raw materials. The increase in raw materials for pandan leaves, such as woven materials or ropes, has strengthened cultural identity while providing economic benefits. Each farmer harvests pandan leaves, with a dry leaf yield of 23 Craftsman x 30kg/mg = 690 kg/mg; 690 x 4mg = 2,760 kg/mo; 2,760 x 10 months = 27,600 kg/year. When the market price was at its highest, 17,500/ko, the additional income of the artisan community was 50 x 17,500 x 4 = 3,500,000/month with only labor capital, without spending costs and processing materials.

Empowering local communities through sustainable craft production can have significant economic and social benefits (Brown, 2021). Growing market demand for such products can boost artisans' incomes and stimulate community development (Smith & Jones, 2022). Moreover, this empowerment fosters resilience within communities by cultivating a sense of pride and ownership over their cultural heritage (Gonzalez, 2023; Taylor, 2022).

6.0. Conclusion

Aesthetics are closely related to creativity, and creativity is greatly influenced by the ability to trigger sensitivity and responsiveness to the response to existing potentials, such as environmental potential, natural resources, local artisan resources, and socio-cultural and technological developments.

This study demonstrates that harmonizing local and global wisdom in the design of environmentally friendly, fashionable, and sustainable craft products is both a viable and beneficial approach. This integration helps preserve cultural heritage and creates appealing and relevant products for the modern market. It also reduces environmental impact and empowers local communities. The findings indicate that a holistic approach to product design can promote ecological and social sustainability, making a meaningful contribution to the design industry and society.

The execution of this research represents an innovative step with numerous benefits. However, to fully realize the potential of this approach, further research is needed to address existing gaps with all its shortcomings. With deeper insights and a more comprehensive approach, this model could significantly contribute to ecological, economic, and cultural sustainability across various communities worldwide.

Acknowledgments

The BIMA supports this research applied research funding program, and we would like to express our deep gratitude for this support. We also wish to thank LPPM of ISBI Bandung and the 2024 ARCADESA organizing committee in Yogyakarta for their assistance.

Paper Contribution to the Related Field of Study

This paper contributes to sustainable design by integrating local cultural elements with global innovations to create eco-friendly and aesthetically pleasing craft products. This research empowers local communities by leveraging traditional wisdom and introduces design practices that support ecological sustainability. Additionally, it provides a foundation for design education and creative industry policy, which offers valuable insights for advancing both practical and theoretical aspects of sustainable design.

References

Armstrong, C. M., & LeHew, M. L. (2020). Sustainable fashion: A path forward. *Fashion and Textiles, 7*(1), 1-12. https://doi.org/10.1186/s40691-020-00212-3

Anderson, D., & Patterson, A. (2022). Sustainability in creative industries: A contemporary review. *Journal of Sustainable Design, 17*(2), 123-145.

Bennett, C., & Kinsella, S. (2021). The impact of local materials on sustainability in craft production. *Sustainability, 13*(2), 745. https://doi.org/10.3390/su13020745

Brown, T. (2021). *Crafting change: The role of sustainable practices in community empowerment*. Routledge. https://doi.org/10.4324/9780367331375

Buchanan, R. (2022). Participatory design: A critical overview and future directions. *Design Studies, 76,* 102-119. https://doi.org/10.1016/j.destud.2021.11.002

Chen, Y., & Burns, L. D. (2021). Cultural sustainability in design: A study of traditional crafts and contemporary markets. *International Journal of Design, 15*(2), 35-50. https://doi.org/10.19224/ijod.2021.1

Cohen, J. (2023). The power of storytelling in craft marketing: Building emotional connections with consumers. *Journal of Consumer Research, 60*(1), 1049-1066.

Fajar, A., & Yulianto, B. (2023). "Inovasi Teknologi dalam Produksi Tradisional: Studi Kasus pada Industri Kerajinan Tangan." *Jurnal Teknologi dan Manajemen*, 18(2), 123-134.

Fletcher, K. (2020). *Sustainable fashion and textiles: Design journeys*. London: Earthscan.

Fletcher, K., & Grose, L. (2012). *Fashion and sustainability: Design for change*. London: Laurence King Publishing.

Fernandez, M., & Liu, J. (2021). Blending the old and the new: Strategies for cultural preservation through design. *Craft Research, 12*(1), 39–57. https://doi.org/10.1386/crre_00035_1

Fischer, A. (2022). Cultural identity and craft: Navigating modern challenges. *Journal of Arts and Communities, 10*(3), 225-240.

Fletcher, K. (2020). *Craft of use: Post-growth fashion* (2nd ed.). Routledge. https://doi.org/10.4324/9780367209485

Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2021). The Circular Economy – A New Sustainability Paradigm?, *Journal of Cleaner Production, 143,* 757-768.

Gonzalez, R. (2023). Community resilience through craft: Fostering cultural identity and economic sustainability. *Sustainable Development, 31*(1), 45-56. https://doi.org/10.1002/sd.2234

Garcia, E. (2021). Craftsmanship and ecology: Preserving traditions in a modern world. *Craft Research, 12(2),* 85-99. https://doi.org/10.1386/cr.2021.0022

Harris, P., & Turner, M. (2024). Innovations in biodegradable materials for sustainable craft practices. *Journal of Sustainable Materials Processing, 15*(1), 12–25. https://doi.org/10.1016/j.jsmp.2023.01.002

Harris, J., & Giannoulis, C. (2022). Sustainable practices in craft production: Innovations and insights. *Journal of Sustainable Design, 10*(3), 215-227. https://doi.org/10.1080/17544267.2022.1234567

Hawken, P., Lovins, A., & Lovins, L. H. (2020). *Natural capitalism: Creating the next industrial revolution*. Back Bay Books. https://doi.org/10.1177/0891243220954791
Klein, R. (2023). Authenticity and craft in a global marketplace. *Journal of Marketing Research, 59*(1), 78-94.

Mason, R., & Wilson, M. (2023). Cultural heritage and sustainable design: The role of local materials in community identity. *International Journal of Design Studies, 29(1),* 115-130. https://doi.org/10.1016/j.ijds.2023.01.005

McCullough, M. (2023). Digital tools in craft production: Innovations for sustainability. *Journal of Design History, 37*(1), 15-30.

Miller, D. (2023). The significance of materiality in sustainable design: An exploratory study. *Design Studies, 74*, 30-47. https://doi.org/10.1016/j.destud.2021.06.003

Müller, A. (2022). Empowering Artisans: Capacity Building for Sustainable Craft Practices. *Journal of Community Development, 30(4),* 325-340.

Namsomboon, S., & Jitcharat, P. (2023). Engaging communities in sustainable design: A participatory approach to craft research. *Journal of Design Research, 21(1)*, 34-50. https://doi.org/10.1504/JDR.2023.123456

Nguyen, T. H., & Zhang, Y. (2022). Sustainable design practices: The role of local materials in reducing carbon footprint. *Journal of Cleaner Production, 345*, 131-145. https://doi.org/10.1016/j.jclepro.2021.131145

Norman, D. A. (2020). Designing for cultural heritage: Integrating local wisdom with global trends. *Journal of Design History, 33(2),* 145-160.

Polak, P. (2008). *Out of Poverty: What Works When Traditional Approaches Fail*. Berrett-Koehler Publishers.

Prabowo, H. (2023). "Meningkatkan Kapasitas Produksi Melalui Penerapan Teknologi yang Sesuai." *Jurnal Pemberdayaan Masyarakat*, 20(1), 78-89.

Rogers, T., & Smith, L. (2024). Preserving crafts in a globalised world: Strategies for relevance and innovation. *Journal of Arts and Culture, 12(1),* 78-94. https://doi.org/10.1080/arts.2024.0012

Rosa, M. (2023). Material Efficiency in Craft: The Role of Digital Design. *Journal of Sustainable Materials, 14(2),* 120-135.

Rosa, M. (2021). Sustainable Practices in Craft Design: Innovations and Impacts. *Journal of Sustainable Materials, 14(4),* 215-230.

Rattanakhamhaeng, S., Wongthong, S., & Boonchuan, K. (2021). Eco-Design Initiative: Local Artisans and Sustainable Fashion in Thailand. *International Journal of Design, 15(1)*, 67-79.

Simpson, L. (2022). Indigenous knowledge and sustainable craft design: A community approach. *Journal of Sustainable Design, 15(4),* 245-260. https://doi.org/10.1016/j.josd.2022.03.002

Smith, J. (2022). The Impact of Local Voices in Craft Production. *Journal of Global Culture, 28(3),* 260-275.

Swann, C. (2021). Design thinking in participatory action research: Enhancing community engagement in design processes. *International Journal of Action Research, 17(2*), 145-162. https://doi.org/10.3224/ijar.v17i2.06

Taylor, R. (2022). Cultural pride and community ownership: Building resilient societies. *International Journal of Cultural Studies, 15(4),* 256-275.

Thorpe, A. (2012). *The Designer's Atlas of Sustainability: Charting the Conceptual Landscape through Economy, Ecology, and Culture*. Island Press.

Thompson, J., & Thomas, H. (2023). Collaboration for Impact: Strengthening Sustainable Craft Industries. *Journal of Sustainable Business, 15(1),* 101-118.

Wang, Y., & Shen, J. (2020). Adapting to change: Marketing and design strategies in response to consumer demand. *Journal of Business Strategy, 41(4)*, 34-45. https://doi.org/10.1108/JBS-02-2020-0036

Yadav, S., & Lee, J. (2023). Eco-Friendly Technologies in Craft Production: A Review of Innovations. *Journal of Cleaner Production, 329*, 129760.

Yair, K., & Schwarz, M. (2011). Making Value: Craft and the Economic and Social Contribution of Makers. *Cultural Trends*, 20(3-4), 271-280.

Yair, M., & Schwarz, L. (2023). Designing for Sustainability: The Role of Ethics in Craft Production. *Design Studies, 44*, 345-362.

Yu, D. (2021). Cultural Heritage and Local Wisdom in Sustainable Design. *Journal of Environmental Psychology, 31(4),* 207-221.

Yu, L. (2020). The Application of Traditional Craft Techniques in Modern Product Design. *Journal of Design History*, 33(1), 57-71.

Zhang, Y., & Zhao, X. (2020). Eco-design strategies: Integrating sustainability into product development. *Journal of Cleaner Production, 248*, 119-132. https://doi.org/10.1016/j.jclepro.2019.119132

Zafirovski, M. (2022). Cultural Sustainability in Craft Design: Challenges and Opportunities. *Journal of Cultural Economics, 36(2),* 189-202.

Zafirovski, M. (2007). The Enlightenment and Its Effects on Modern Society. *Journal of Social History*, 40(4), 925-937.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Parametric Design Inspiration Derived from Batik Motif Concepts in Artwork within an Environmental Context

Rafeah Legino[1*], Ruzayqah Mohd Ghazali[2], Yulyta Kodrat[3], Ramlan Abdullah[4]

**Corresponding Author*

[1] Faculty of Art & Design, Universiti Teknologi MARA, 40450 Shah Alam, Selangor Malaysia
[2] College of Built Environment, Universiti Teknologi MARA, Perak Branch, Seri Iskandar Campus, 32610 Seri Iskandar, Perak Malaysia
[3] Interior Design Study Programme, Faculty of Visual Art, Institut Seni Indonesia Yogyakarta, Yogyakarta, Indonesia
[4] RAG Studio, Subang Hi-Tech Industrial Park, Subang Jaya Selangor, Malaysia

rafeahl@uitm.edu.my,ruzayqahghazali@gmail.com, yulyta_kodrat@isi.ac.id, lansculp07@gmail.com
Tel: +60173680870

Abstract

This project explores the fusion of traditional Malaysian batik motifs with parametric design to create art that responds to the environment. It focuses on the convergence of traditional batik motifs and parametric design within an environmental context, showcasing an exploration of how cultural heritage, technological innovation, and ecological awareness can be seamlessly integrated into fine art. Sustainable materials are incorporated to align with ecological principles and minimise waste. The resulting artworks interact with environmental factors, such as light and space, to create dynamic installations. This research demonstrates how traditional motifs can evolve through digital innovation and studio practice, offering new pathways for artistic expression and environmental stewardship in contemporary art and design.

Keywords: Algorithmic Art, Batik Motifs, Cultural Heritage, Parametric Design

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6152

1.0 Introduction

Parametric design has emerged as a powerful tool in contemporary art and design, enabling the creation of intricate forms and patterns through computational processes. This approach, which relies on processes to manipulate design parameters, offers unparalleled flexibility and precision, allowing artists and designers to explore complex geometries and dynamic structures. In parallel, traditional art forms such as batik inspire and influence various creative disciplines with their rich cultural heritage and intricate motifs. Batik, a traditional textile art originating from Southeast Asia, particularly Malaysia and Indonesia, is renowned for its elaborate patterns and symbolic meanings. The motifs, often inspired by nature, mythology, and cultural beliefs, have been passed down through generations, embodying the essence of Malay cultural identity. Despite its deep historical roots, batik has evolved, adapting to modern tastes and technologies while preserving its traditional essence.

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6152

This research endeavours to merge the ancient art of batik with the contemporary realm of parametric design. By integrating batik motifs into parametric algorithms, the study aims to produce innovative artworks that pay homage to the traditional aesthetic principles of batik and push the boundaries of modern design. Through this amalgamation of tradition and technology, the research contributes to the preservation of cultural heritage while introducing new possibilities for artistic expression in the digital age. The study commences by examining the structural and aesthetic principles underlying batik motifs, delving into their symbolic significance and design logic. It then explores the process of translating these motifs into parametric design frameworks, highlighting the challenges and opportunities encountered in this creative pursuit. The resulting artworks are scrutinised to evaluate their efficacy in harmonising traditional motifs with modern design principles, ultimately aiming to showcase the potential of parametric design as a means of safeguarding and rejuvenating cultural heritage.

2.0 Review of Related Literature and Artwork

Parametric design, a process of utilising algorithmic thinking to express design logic, has seen growing integration in the field of architecture and artwork. This method has provided novel ways to reinterpret traditional cultural motifs, such as batik, within contemporary design practices (Shamsudin et al., 2018). The reinterpretation of batik motifs through parametric design allows for the digital manipulation of patterns, making them adaptable to various forms and functions, including artwork, product design, and architecture. Batik is a traditional Malaysian and Indonesian textile art characterised by intricate patterns and designs (Legino, 2012; Sobri & Legino, 2020). Historically, batik motifs hold significant cultural meaning, symbolizing aspects of local identity, spirituality, and social hierarchy (Mohd Morni, 2024). According to Abdullah et al. (2020) and Legino et al. (2022) traditional batik motifs are geometric and organic, inspired by flora, fauna, and religious symbols. These motifs offer a rich source of inspiration for modern design processes due to their complex symbolism and aesthetics.

In contemporary design research, there has been a shift toward preserving the cultural heritage of batik while allowing for modern reinterpretations that extend the use of these motifs beyond traditional textiles. As suggested by Kristiana et al. (2023), parametric design offers an ideal platform for this reinterpretation. It enables designers to explore the transformative potential of batik motifs while preserving their cultural essence. Parametric design utilizes computational tools to manipulate design parameters, making it possible to generate intricate, dynamic forms from simple inputs. In the context of motifs, parametric tools like Rhino and Grasshopper allow designers to automate the repetition, rotation, and scaling of patterns to create adaptive, flexible designs for modern applications.

Recent research by Haghighat & Sadeh (2023) highlights the role of parametric design in preserving cultural heritage by translating traditional motifs into forms suitable for architectural facades and installations. While Putra et al. (2021) emphasise how the algorithmic manipulation of batik motifs in parametric design not only serves as a means of aesthetic innovation but also maintains a strong cultural connection. This approach bridges traditional craftsmanship with modern digital fabrication techniques, ensuring that the cultural values embedded in batik motifs are retained even as they evolve into new formats.

The intersection of parametric design and traditional batik motifs has sparked a new wave of contemporary artworks and architectural forms. Artists and designers are leveraging parametric tools to explore batik-inspired designs, creating installations, sculptures, and architectural facades that reinterpret batik patterns through computational processes. For instance, a case study by Musa (2019) illustrates how batik motifs can be translated into complex architectural surfaces through parametric design. Their work showcases the adaptability of batik motifs in shaping dynamic, curvilinear forms that interact with light and shadow. This exploration of parametric design and batik motifs provides new possibilities for integrating traditional cultural elements into modern contexts, particularly in public art and architecture. Similarly, Datta and Beynon (2016) discuss the growing use of parametric design in contemporary Southeast Asian art, where batik motifs are reimagined as digital patterns that inform large-scale interactive artworks. Their research suggests that this method allows for the creation of artworks that can respond to environmental stimuli or human interaction, thereby breathing new life into traditional motifs while maintaining their relevance in a digital era.

The incorporation of batik motifs into parametric design offers an innovative means of preserving and celebrating cultural heritage while embracing the opportunities afforded by digital technology. Through computational tools, designers can explore new forms and applications of these traditional patterns, ensuring their continued relevance in contemporary artwork and architectural design. The works of Indrawan (2017), Jenkyn-Jones (2011), and Cong and Zhang (2024) underscore the potential for parametric design to serve as a bridge between tradition and modernity, enabling cultural motifs to evolve while maintaining their core symbolic meanings. Several contemporary artists and designers, including batik, have employed parametric design principles to reinterpret traditional cultural motifs.

3.0 Methodology

The methodology for this research explores the integration of parametric design, inspired by traditional batik motifs, within an environmental context in fine art practice. The objective is to create artworks that not only reflect cultural heritage but also respond to environmental considerations, such as sustainability, material reuse, and ecological impact. The use of parametric design tools allows for a deeper exploration of how traditional motifs can inform environmentally conscious art practices

3.1 Conceptual Framework

The conceptual framework builds on the relationship between cultural heritage, environmental sustainability, and technological innovation. Traditional batik motifs, rich in cultural meaning, are reimagined through parametric design to create environmentally responsive artworks. This framework draws on key concepts from environmental art, sustainable design practices, and digital fabrication,

exploring how patterns can serve as a medium for engaging with ecological themes in contemporary art. By combining traditional patterns with modern technology, this approach aims to address issues such as the environmental impact of art materials, the promotion of sustainable practices, and the role of cultural preservation in fostering environmental stewardship.

3.2 Creative Process and Material Exploration

The creative process emphasises the use of environmentally friendly materials and techniques that align with sustainability principles. The stages of this process are as follows:

- Research and Data Collection: The research begins with a study of traditional batik motifs, focusing on their cultural and symbolic meanings as well as their geometric structures. An environmental analysis is also conducted to identify sustainable materials and techniques that can be incorporated into the artworks.
- Pattern Digitization and Parametric Design: Traditional batik motifs are digitised and manipulated through parametric structure. This phase includes exploring how the geometric patterns of batik can be adapted to create artworks that interact with environmental factors, such as natural light, airflow, or weather conditions.
- Material Testing with a Focus on Sustainability: Sustainable and eco-friendly materials, such as recycled fabrics, biodegradable plastics, and natural dyes, are explored for the creation of physical artworks. The aim is to align the environmental focus of the work with the traditional roots of batik, which historically involved natural dyes and organic materials.
- Integration of Environmental Elements: In this stage, the parametric designs are developed with environmental responsiveness in mind. For example, b-inspired patterns are generated in a way that allows the artwork to respond to natural elements, such as wind or sunlight. This approach is aimed at creating interactive, environmentally integrated artworks that engage viewers with both cultural and ecological themes.

3.3 Creative Process and Material Exploration

This stage of the methodology is carried out in an iterative process of creation, reflection, and refinement. The studio-based research allows for the exploration of how parametric design can lead to environmentally responsive artworks.

- **Creation**: Initial prototypes and artworks are created using parametric designs of batik motifs. The artworks are developed using sustainable materials and tested for their environmental interaction, such as how they react to changes in light or air movement.
- **Reflection**: Each iteration is examined critically to assess its cultural and environmental impact. Reflection includes reviewing whether the artworks successfully integrate traditional batik patterns with environmental concerns and sustainable materials.
- **Refinement**: Based on reflection, adjustments are made to both the design and materials. This might include tweaking the parametric algorithms, experimenting with new sustainable materials, or refining the artwork's interaction with environmental elements.

3.4 Exhibition and Environmental Impact Awareness

The final phase of the research involves presenting the completed artworks in an exhibition designed to engage audiences with environmental and cultural themes. The exhibition not only showcases the parametric reinterpretation of batik motifs but also highlights the importance of sustainability in contemporary art practice. Visitors are encouraged to interact with the artworks, observing how they respond to environmental factors, thereby promoting awareness of ecological issues.

4.0 Result and Discussion

Fig. 1: Parametric composition 1, Rafeah Legino, 2023.
(Source: Rafeah Legino)

The artwork in the Fig. 1 and Fig. 2 presents a geometric, pattern-based design framed within a circular form. Upon closer examination, it appears that the design consists of interconnected star and floral motifs, arranged in a symmetrical, stacked composition. This arrangement can be viewed as a contemporary exploration of traditional batik motifs, interpreted through a parametric design approach. Below is an in-depth analysis of the artwork within the context of parametric design inspired by batik motifs and environmental considerations.

Fig. 2: Parametric composition 2, Rafeah Legino, 2023.
(Source: Rafeah Legino)

4.1 Parametric Design and Batik Motif Interpretation

The geometric motifs seen in the artwork resemble traditional batik patterns, particularly the star and floral designs that are common in both Malaysian and Indonesian batik. In this case, the motifs have been rendered with precision and mathematical clarity, suggesting the use of parametric design tools. Parametric design allows for the generation of complex, repeating patterns based on input parameters such as scale, rotation, and symmetry, which are key elements observed in this artwork. The repetition of floral and star patterns in this circular composition reflects a common aesthetic in batik design, where organic motifs are often repeated rhythmically across a fabric canvas. The parametric approach introduces a contemporary twist, offering a level of exactness and consistency that might not be achievable through traditional hand-drawn batik techniques. The precision of the motifs suggests that the artist employed algorithmic processes to ensure symmetrical alignment and proportional scaling, key aspects of parametric design.

4.2 Symbolism and Cultural Reference

The floral and star motifs are not arbitrary; they are rooted in cultural symbolism commonly found in batik art. In traditional batik, floral patterns often symbolise beauty, fertility, and life cycles, while geometric patterns like stars may represent guidance, harmony, or spiritual elements. In the context of this work, the symmetrical arrangement of these motifs could symbolise the interconnectedness between natural and cultural systems. The upward pyramid-like arrangement suggests growth or a spiritual ascension, which may reflect themes of environmental harmony. The circular framing of the work, often a symbol of unity and wholeness, reinforces the idea of environmental balance—further aligning with the ecological context.

4.3 Material and Environmental Considerations

The circular frame, possibly metallic, reflects a deliberate choice of materials that align with both sustainability and tradition. The smooth, reflective surface could indicate the use of sustainable materials, such as recycled metal or eco-friendly alternatives, which are commonly emphasised in contemporary art that engages with environmental themes. The use of parametric design could also support sustainability by minimising material waste. Parametric tools allow artists and designers to precisely calculate the amount of material needed for production, reducing excess and encouraging efficient fabrication processes. Additionally, the dark background of the composition highlights the bright, golden-coloured patterns, possibly drawing attention to the contrast between nature (light) and human intervention (darkness). This could be interpreted as an environmental commentary on the balance between human-made designs and the natural world, emphasising the need for sustainable practices in both art and industrial design.

4.4 Environmental Integration and Responsiveness

While this artwork may not appear directly interactive with environmental factors, the design itself lends itself to an exploration of environmental themes. For instance, if displayed in an outdoor or open environment, the reflective properties of the metallic material may respond to changes in light, creating dynamic visual effects as the ambient light shifts throughout the day. This interaction between the artwork and its surroundings could symbolise the constant exchange between human creativity and environmental conditions. Moreover, the parametric approach allows for the scaling and adaptation of this design to various contexts, such as larger architectural installations or environmentally responsive art. By manipulating the parameters of the design, the artist could create larger, site-specific installations that interact with the natural elements of the space—such as airflow, sunlight, or water.

5.0 Conclusions

The project combined traditional batik motifs with parametric design in an environmental context, demonstrating how cultural heritage, technological innovation, and ecological awareness can be integrated into fine art. By using parametric design tools to reinterpret batik patterns, the project preserved the cultural significance of these motifs while introducing contemporary forms that align with modern environmental concerns and sustainable art practices. The project emphasized cultural preservation, environmental responsiveness, and sustainability. It integrated eco-friendly materials and sustainable design practices, highlighting the importance of reducing the environmental impact of art production. The use of parametric design enabled precise calculations of material use, minimising waste and promoting efficient fabrication processes. The artworks encouraged interaction with environmental factors, reflecting the growing trend of environmentally responsive art. The project also highlighted the transformative power of technology in art, offering flexibility and precision in manipulating batik motifs in innovative ways while maintaining their traditional structure. The incorporation of parametric design opened new avenues for traditional motifs to be applied across multiple disciplines, bridging the gap between art, design, and architecture. By reinterpreting traditional motifs through parametric design and environmental considerations, the project illustrated that cultural patterns can be modernised without losing their meaning or significance. This approach reinvigorated traditional art forms and introduced them to new audiences, fostering an appreciation for the cultural narratives they carry. Overall, the project successfully integrated cultural heritage, sustainability, and digital technology in the creation of contemporary artwork, demonstrating how artists can create innovative work while respecting cultural traditions and addressing current global challenges.

Acknowledgements

This study was generously funded by (FRGS/1/2019/WAB04/UITM/02/), to whom I extend my sincere gratitude for their support.

Paper Contribution to Related Field of Study

The study highlights how traditional motifs can be preserved and reinterpreted through modern design, contributing to cultural heritage in design.

References

Abdullah, A. H., & Samin, M. A. (2020). The sustainability of flora, fauna and geometric motif designs among batik tulis manufacturers in Klang Valley. *International Journal of Heritage, Art and Multimedia*, *3*(9), 11-24.

Cong, X., & Zhang, W. (2024). Design of geometric flower pattern for clothing based on deep learning and interactive genetic algorithm. *Journal of Intelligent Systems*, *33*(1), 20230269.

Datta, S., & Beynon, D. (2016). *Digital archetypes: adaptations of early temple architecture in South and Southeast Asia*. Routledge.

Haghighat, S., & Sadeh, H. (2023). Parametric design of an automated kinetic building façade using BIM: A case study perspective. *Journal of Building Engineering*, *73*, 106800.

Hu, Y., & Zhuo, L. (2024). Innovative Applications of Virtual Reality in Cultural and Creative Product Design.

Indrawan, S. E. (2017). Alternatives Formation of Bricks Pattern from Trowulan through parametric design.

Jenkyn-Jones, S. C. (2011). Fashion design: the dynamics of textiles in advancing cultural memes. In *Textile Design* (pp. 232-262). Woodhead Publishing.

Kristiana, S. P. D., Asih, A. M. S., & Sudiarso, A. (2023). Designing Simulation to Improve Production Efficiency of Batik Industry. *Simulation & Gaming*, *54*(6), 730-759. https://doi.org/10.1177/10468781231205667

Legino, R., Zuhir, N., & Samin, M. A. (2022). Geometrical Motifs Batik Sarongs Kelantan and Terengganu. Environment-Behaviour Proceedings Journal, 7(SI9), 457–461. https://doi.org/10.21834/ebpj.v7iSI9.4295

Legino, R. (2012). Malaysian batik sarongs: A study of tradition and change. *School of Art, RMIT Australia*.

Mohamad Morni, A. A., Samin, M. A., & Legino, R. (2024). Local Plant Motif of Kain Suket Ajang. *Environment-Behaviour Proceedings Journal*, *9*(SI17), 89–95. https://doi.org/10.21834/e-bpj.v9iSI17.5424

Musa, Z. B. (2019). The impact of motifs and patterns on surface design in fashion and textile design on people's emotions.

Putra, F. A., Jamil, D. A. C., Prabandanu, B. A., Faruq, S., Pradana, F. A., Alya, R. F., ... & Saputra, F. O. (2021, November). Classification of Batik Authenticity Using Convolutional Neural Network Algorithm with Transfer Learning Method. In *2021 Sixth International Conference on Informatics and Computing (ICIC)* (pp. 1-6). IEEE.

Shamsudin, M. K., Bongsu, M. A. C., & Legino, R. (2018). Reinterpretation of Multiracial Culture in Malaysia Through New Series of Installation. In *Proceedings of the Art and Design International Conference (AnDIC 2016)* (pp. 487-498). Springer Singapore.

Sobri, A. I., & Legino, R. (2020). Imitation of Batik Sarong design and features. *Environment-Behaviour Proceedings Journal*, *5*(SI3), 99-108.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics, WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Raising Environmental Awareness through the Making of Craft-Based Object

Alvi Lufiani[1*], Yulriawan Dafri[1], Syed Mohd Faisal Syed Ahmad[2]
**Corresponding Author*

[1] Faculty of Visual Arts, Indonesia Institute of the Arts, Yogyakarta, Indonesia
[2] College of Creative Arts, Universiti Teknologi MARA, Selangor, Malaysia

alufiani@isi.ac.id, yulriawandafri@isi.ac.id, syedfaisal@uitm.edu.my
Tel: +62 85729910300

Abstract
The creation of craft products plays a vital role in increasing environmental awareness and creating a better environment. This research aims to explore several activities that raise public awareness. The methods used are cultural studies and interdisciplinary. The research results show that craftsmen and business people have carried out the basic principles in making environmentally friendly craft products. The reason is that it is an ancestral cultural heritage and the natural character of craft objects. The education and financial sectors need support to maintain the environmental awareness movement.

Keywords: Environmental awareness; craft-based object

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6164

1.0 Introduction

Environmental issues will never be separated from daily human life. The creation of craft products has a vital role in creating a better environment. One way is to use environmentally friendly and sustainable materials and a process prioritizing nature conservation. Our predecessors have done this by applying organic materials or using materials around us, as well as slow processes. Optimizing materials can also minimize fuel use to save energy and reduce pollution. This is evident from the environment maintained in its beauty; the air feels cool and clean. Of course, they all impact the health of awake residents, who have a long and good quality of life. That was the situation in the old days. Currently, the condition has changed. Artificial materials, synthetic dyeing, and fast-paced processes have changed everything.

This situation is inseparable from the increasing needs of the community, economy, society, business, and even politics. Likewise, market demand must be accommodated quickly and as much as possible to reap profits. From the data obtained, Indonesia's original craft products have been proven to provide significant economic benefits for the country. In 2023, the figure touched USD 912.2 million. This revenue decreased in 2022 due to the influence of the recession and the global economy. However, the craft industry sector is still a profit generator for MSMEs and exporters. In addition, craft products in Indonesia have many global enthusiasts (ukmindonesia.id). On the one hand, market demand is high, which benefits many parties, especially business actors, and increases the country's foreign exchange. On the other hand, the negative impact of this phenomenon is that business owners will exploit natural resources and ignore

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6164

the losses caused (https://money.kompas.com). This situation cannot continue because it will cause a domino effect, leading to more devastated disasters with unexpected losses.

This article will discuss several activities that can be done to raise public awareness, especially business actors in the craft-based art sector. Craft objects or products produced by craft business activists can show consumers or the wider community tangible evidence of their contribution to protecting the environment.

This study is essential to educate various parties in each line about preserving nature in craft product production, starting from business actors, marketers, intermediaries, consumers, and even students or students interested in doing business in the crafts field.

2.0 Literature Review

2.1 Environmental Awareness

Environmental awareness can be interpreted as understanding how one or a group of people protect the ecosystem and environmental sustainability (Pramita *et al*., 2023). Not only as an introduction to problems and understanding, environmental awareness can directly and indirectly affect environmental behavior (Grob in Ferreira *et al*., 2023).

Environmental awareness is an action or behavior directed toward understanding the importance of health, a clean environment, etc. Environmental awareness can be seen in the person's behavior and actions in a stress-free situation (Amos, 2008). Decisions should be taken according to environmental management in a way that suits human needs by preserving or improving the quality of the environment.

Four factors affect environmental awareness. One of them is the humanitarian factor. Humans can choose what is right and wrong because of their natural nature. Humans also have sensitivity and a sense of humanity, impacting their concern for other humans. He is concerned about caring for others, wants to do his best, and does not harm other human beings as much as possible. This reason gives humans a sense of responsibility to be more aware of the environment and take care of it for the common good. Another factor is lifestyle. The lifestyle influences a person's level of concern or awareness of the environment. The higher a person's interest or attention in a green lifestyle, the more they will care and focus on environment-related behaviors. Any action or behavior will refer to environmentally friendly activities and how they can save the damaged environment (Amos in Gabriela and Sugiarto, 2020).

2.2 Craft-Based Object

Craft-based objects or products have many definitions. Craft objects were understood as making something with hands and thinking through hands by manipulating and exploring materials (Nimkulrat, 2010). This understanding follows Adamson's (2007) view that the concept of art is a way of thinking through various activities. It starts with processing mediums, techniques, tools, and ideas and ends with finally becoming a work with a message. Different with design thinking, craft thinking relates thinking and intelligence to actions performed by hand since craft is putting collaboration with the material on centre stage (Brinck, 2024). Thus, what people called the endeavor of material.

Craft items are currently separated into traditional, modern, or contemporary crafts, just like other fine art categories. Reproducing cultural forms, models, and designs using particular techniques determines what constitutes traditional crafts (Walker, 1989; Nugraha, 2012). Practices, artifacts, places, the environment's interactions with nature and history, and the preservation of professional tacit knowledge and disappearing traditions are all examples of traditional craftsmanship (Nugraha, 2012; Kokko & Kaipainen, 2015; Unesco, 2003). On the other hand, many also interpret traditional crafts as handicraft products, but ontology can be said to be different. The reason is that handicraft products lack innovation, are functional and practical, and tend to be made in mass production. On the other hand, traditional craft pieces feature elements of originality in notions and images, even though they employ old equipment and techniques. Not only are these items non-functional, but they are also handmade.

It is also said that Craft includes 'formal knowledge, tacit knowledge, physical and mental skill, contextual awareness, innovation, and personal creative autonomy' (Press & Cusworth, 1997, p. 16). Adamson (2010) considered craftsmanship to be small-scale production with knowledge based on materials and skills. One of the most significant inputs is the knowledge gained over many years of apprenticeship (Gamble, 2004, p. 190). Through this knowledge, craftsmen bring a product to the market using specific tools and try to understand and overcome the difficulties that arise outside their control during the artifact's creation (Hoxie,1920, p. 131).

Craftworks are the result of contemplation since many things can be conveyed from a craft object.. A craftsman will dedicate time, energy, and mind to produce timeless, substantial works. Contrarily, a reliable craftsman is also good at responding to situations to create an artistic object that is in harmony with the spirit of the times.

3.0 Methodology

The methods used are the cultural studies approach and the interdisciplinary method. Operationally, this approach and method work by placing culture as a form of behavior, attitudes, ideas, and works of the community as something dynamic, daily, and complex. Therefore, culture cannot be understood from a monodisciplinary perspective (Puspitasari, 2016, p. 58). ecological, aesthetic, and cultural theories are used. Ecological aesthetic theory explores the link between art and the environment, promoting how a work of art reflects and responds to ecological principles. Cultural theory discusses how cultural values, beliefs, and activities affect human behavior and environmental attitudes. This theory also makes it easier to understand how cultural contexts shape artists' and/or craftsmen's

approaches to environmental sustainability. The method used in this research is to examine craft objects that are considered to be an example of concern for the environment in the aspect of the manufacturing process.

4.0 Findings

Craft objects whose realization process shows concern and awareness of the environment usually start from selecting environmentally friendly materials. Of course, it is not only the selection of materials but also the basic principles that are the main thing in making environmentally friendly products. These principles are: Refine, Reduce, Reuse, Recycle, Recovery, and Retrieve energy (disperindag.jatimprov.go.id).

Small-medium business actors have applied most of these aspects to craft object production. It also aligns with the natural character of crafts, namely, using organic materials. The ancestors used natural materials to make objects to support their daily lives, such as food containers, cooking utensils, household utensils, furniture, etc. Then, in line with the development of the times, the product or craft object incarnates in various forms, such as fashion, home décor, art-craft work, and other furniture.

One of the things that has received exceptional attention is what was done by fashion business actor (women's bags) Dewi Febriana Syamri, the owner of the local brand Sakombu Eco Basket. From the name, it can be seen that the products produced from the Sakombu brand are environmentally friendly. Interestingly, Dewi uses organic materials from the process stage, which is very natural. She mobilized women, namely housewives, to be directly involved in the production of the bags so that these mothers would always be used to caring about the environment. This is because they know that if the environment is damaged, the bag-making materials will experience difficulties, so the production process is hampered. The ingredient for making Sakombu is Mansiang, a weed that grows in swamps. The manufacturing process can take up to nine months, starting from harvesting, drying, picking, and scraping. This is done so that the fiber is easy to weave. In the dyeing process, around 90 percent of Sakombu products use the original color of mansiang fiber, so there is no chemical process. The rest, as many as ten percent, apply synthetic dyeing. Dewi also seeks awareness of the environment through educational activities for craftsmen. She regularly visits and even stays overnight at the homes of artisans who are, on average, 50 to 80 years old. Together with her craftsmen, Dewi weaves and discusses the latest designs, emphasizing the importance of protecting the environment by creating environmentally friendly products (https://kemenparekraf.go.id). That way, the artisan mothers understand the importance of caring for environmental sustainability, and this knowledge is passed on to their children and grandchildren. Below are products from Sakombu Eco Basket, whose production process emphasizes eco-friendly products.

(a) (b)

Fig. 1. (a) Women's handbag with natural dyes; (b) A craftswoman weaving fiber
(Source: https://kemenparekraf.go.id/)

5.0 Discussion

More and more businesspeople in craft products, craftsmen, and artists are applying and disseminating the use of environmentally friendly materials and production processes to attract a wider audience. One way is to introduce environmentally friendly concepts in schools and communities. This method is more or less effective in increasing ecological awareness among high school students and the community. Through creative, fresh, and innovative delivery, the awareness of caring for the environment is more accessible to channel. Craftsmen and businesspeople also convince the community that preserving the environment is a shared responsibility and is part of daily activities. It is just that because it has become a habit, they often do not realize it.

From a contemporary perspective, concern for the need to take care of nature has been consistently expressed by an alumnus of the craft study program, faculty of fine arts, ISI Yogyakarta. Novi, better known as Novi Bamboo, is the owner of CV. Panelindo produces various pieces of furniture made from bamboo and other fashion (eco-fashion). Apart from being an entrepreneur, Novi can be called an environmental warrior who consistently spreads her knowledge, insights, and experience to many parties related to eco-fashion. They are starting with students in elementary and secondary schools, the general community, and people with disabilities. Uniquely, people with disabilities feel that by using the hammering technique in the eco-print process, they can release their pent-up emotions. What makes them happier is that they are delighted with the final result, although sometimes it is still far from perfect. Of course, this is a very positive thing. Novi is also often asked by the Office of the Ministry of Cooperatives to share knowledge with small- and medium-

sized entrepreneurs concerned about using natural materials. She also does not hesitate to help in marketing and introduce the SME product at a higher level if it is considered sufficiently qualified. Interestingly, Novi always emphasizes that craftsmen utilize natural materials around them to cut production duties. She always reminds businesspeople and craftsmen of the importance of prioritizing ethics. This is because the market for eco-friendly products is still very wide open and can continue to survive with strength in quality, storytelling, and the consistency of environmentally friendly production processes. Below is a photo of an eco-fashion product produced by Novi Bamboo.

(a) (b)

Fig. 2. (a) Eco-fashion by Novi Bamboo; (b) Women's Top eco-fashion by Novi Bamboo
(Source: www.novibamboo.com)

At best, a new sustainable fashion system can create value for people, the planet, and profit (see Figure 3). The system can create a safe environment for people by using fewer chemicals in production, i.e., safe products for end-users. This system can also promote greater product satisfaction through better quality and longer-lasting products. Less materialistic consumption can promote well-being and happiness (Niimäki, 2010). We can learn to invest in higher quality and more expensive products, use them longer, own less, and take good care of our possessions. This is what is commonly known as the 6 R's related to concept of environmentally friendly technology namely Reduce, which means reducing the amount of waste by optimizing the use of materials. Refine, which means using materials that are environmentally friendly and through processes that are safer than previous technologies. Reuse, which means reusing unused or waste materials and processing them in a different way. Recycle, which means almost the same as reuse, except that recycle reuses materials or waste and is processed in the same way. Recovery, which means the utilization of certain materials from waste to be processed for other purposes. Retrieve Energy, which means saving energy in a production process (environment-indonesia.id)

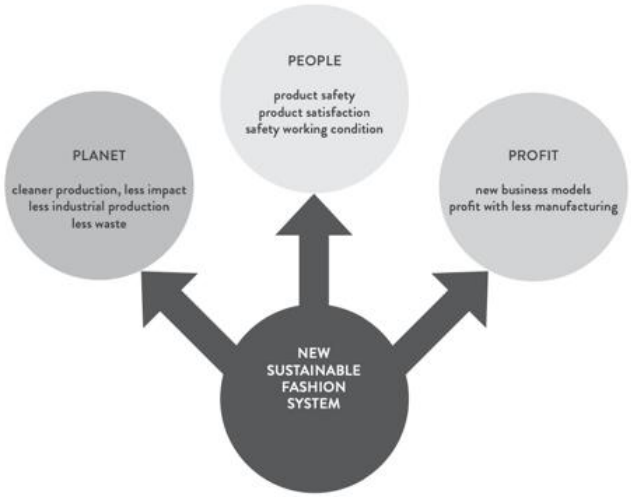


Fig. 3. Value for people, planet, and business created by sustainable fashion
(source: https:/aaltodoc.aalto.fi/)

The thing to remember from the activities of environmental activists is the aspect of improving living standards based on the financial benefits that can be obtained from environmentally friendly businesses. Undeniably, these business actors or craftsmen must be able to continue to exist in business so that if they lose instead of profit in running a business, they are certainly not interested in continuing it. For this reason, the product or craft object produced from the environmentally friendly process must not only have aesthetic value but also be able to reflect the principles of ecological alignment.

6.0 Conclusion and Recommendations

It Is essential to understand the need to increase environmental awareness, which needs to be done consistently, sustainably, and continuously. Especially from the aspect of education, both formal and non-formal education. Children need to be taught the importance of protecting nature from an early age through innovative and refreshing activities. The goal is for them to respond enthusiastically and easily permeate their memories.

As seen from the preceding explanations and examples, a craft object, one of the cultural goods, plays a significant role in raising public awareness and comprehension of environmental issues, especially regarding production aspects. The reason is that environmentally friendly craft products must start from upstream to downstream, from material selection, preparation, production process, and finishing to marketing. They are also very aware of the importance of ethical trade, which benefits producers and consumers. The existence of direct sales from producers to consumers, both online and offline, will facilitate communication between the two parties. This allows manufacturers more freedom to campaign to consumers on environmental issues.

It is also important to underline that makers, craftsmen, and entrepreneurs in the craft field can make social changes at the post-colonial level and in the global economy. The basis is the skills, insights, and way of working that make them instinctively and sincerely able to collaborate with the local community. Art workers, craftsmen, and craft business actors are used and trained to create works that can arouse the environmental awareness of their audience. This is because of various experiments, actual activities, cultural values, customs, and norms that are always carried out continuously. All of them affect the way of thinking and behaving towards environmental awareness.

It can be said that craftsmen play an essential role in contributing to the issue of sustainability, not only by producing sustainable products and embracing audiences but also by observantly being able to take advantage of business gaps to be at the forefront of business activities. This provides real benefits for craftsmen, entrepreneurs, and craftsmen so that their enthusiasm to create quality eco-friendly products is maintained.

Some aspects that need to be improved are the involvement of educational elements on various scales to disseminate an understanding of the need to protect the environment. Educational infrastructure needs to be continuously developed and maintained to ensure that sustainable development can be created. The reason is that economists or businessmen argue that the existence of a quality learning experience can produce humans who can think critically. From this critical thinking, environmentally friendly objects that continue to be sustainable are created. In addition, collaboration between the realm of crafts and other fields in the scope of fine arts and science needs to be strengthened to enable the creation of craft objects that are not only full of cultural content but also artistic and sustainable.

Another aspect is the involvement of financial institutions supported by the government. Assistance in the form of funds is significant for developing research and development for both independent craftsmen and business actors. This is so that all parties can continue to be productive and innovative in creating quality eco-friendly products that can be accepted globally.

Acknowledgments

The author would like to thank the Faculty of Visual Arts, Indonesia Institute of the Arts (ISI) Yogyakarta, for providing the opportunity and assisting the author in publishing this article. In addition, the author also expressed her gratitude to all parties and resource persons, especially to Novi Bamboo, owner of CV. Panelindo in Yogyakarta, who have provided data and information so that this paper can be published.

Paper Contribution to Related Field of Study

This paper contributes to the field of craft in particular and visual arts in general. In the craft field, students and teachers need to understand the importance of protecting the environment and inviting the surrounding environment to care more. This starts from the production process of selective and nature-based craft objects. For business people, environmental awareness will provide profits financially and in terms of production cost efficiency. A preserved environment occurs when there is a positive synergy between craftsmen, business people, teaching staff, and the community to prioritize environmentally friendly production processes that create environmentally friendly products. The full support of policymakers, government, and the wider community strengthens this.

References

Adamson, G. (2007).*Thinking through craft.* New York: Berg Publishers

Adamson, G. (2010). *The Craft Reader*. London: Berg

Ferreira, L., Oliveira, T., & Neves, C. (2023). Consumer's intention to use and recommend smart home technologies: The role of environmental awareness. *Energy,* 263, 4.

Gabriella, D.,A., & Sugiarto, A. (2020). Kesadaran dan Perilaku Ramah Lingkungan Mahasiswa di Kampus. *Jurnal Ilmu Sosial dan Humaniora,* 9(2), 3.

Handan Temeltas & Cigdem Kaya (2021). Transfer of Craft Knowledge to New Product Development through Collaboration between Craftsmen and Designers, *The Design Journal*, DOI: 10.1080/14606925.2021.1947947

Kokko, S., & M. Kaipainen. (2015). "The Changing Role of Cultural Heritage in Traditional Textile Crafts from Cyprus." *Craft Research* 6 (1): 9–30. doi:10.1386/crre.6.1.9_1.

Neolaka, A. (2008). Kesadaran Lingkungan. Jakarta: PT. Rinika Cipta

Niinimäki, K. (2010). Eco-clothing, consumer Identity, and Ideology. *Journal of Sustainable Development.* Vol. 18:3, pp. 150–162.

Nimkulrat, N. (2012). Hands-on Intellect: Integrating Craft Practice into Design Research. *International Journal of Design,* 6(3), 2.

Nugraha, A. (2012). *Transforming Tradition*. Helsinki: Aalto University.

Pramita, F., Taufik, M., Jumailah, Ikal, I., & Subroto, G. (2023). The Significance of Environmental Awareness for Protecting Nature and Cherishing the E. Bio Web of Conferences 79:01001

Press, M., & A. Cusworth. (1997). "A New Vision in the Making: Exploring the Value of Craft Education in the Information Age." *The Design Journal* 1 (sup1): 12–29. doi:10.2752/146069297790219422.

Puspitasari, D.G., Sabana, S., & Ahmad, H.A. (2016). The Cultural Identity of Nusantara in a Movie Entitled Sang Pencerah by Hanung Bramantyo. *Harmonia: Journal of Arts Research and Education,* 16(1), 57-65.

Väänänen, N. & Pöllänen, S. (2020): Conceptualizing Sustainable Craft: Concept Analysis of Literature, *The Design Journal,* DOI: 10.1080/14606925.2020.1718276

Walker, J. A. (1989). Design History and the History of Design. London: Pluto Press.

Zhan, X., & S. Walker. (2018). "Value Direction: Moving Crafts toward Sustainability in the Yangtze River Delta, China." *Sustainability* 10 (4): 1252–1220. doi:10.3390/su10041252.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta
https://arcadesa.isi.ac.id/index.html
8th Art, Craft and Design in Southeast Asia International Symposium
ISI Yogyakarta Indonesia, 27-28 September 2024
Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Reflecting on a Century of André Breton's Surrealism: Surrealistic art exhibition at the Oei Hong Djien Museum

Martinus Dwi Marianto[1*], Oei Hong Djien[2], Heri Kristanto[3], Suwarno Wisetrotomo[4]
**Corresponding Author*

[1] Faculty of Visual Arts, Indonesia Institute of the Arts Yogyakarta, Yogyakarta, Indonesia
[2] OHD Museum, Magelang, Indonesia
[3] Indonesia Association of Sculptors, Yogyakarta, Indonesia
[4] Graduate Program of Indonesia Institute of the Arts Yogyakarta, Yogyakarta, Indonesia

mdwimarianto@gmail.com, ohd2008@gmail.com, artwan1967@gmail.com, suwarno.wisetrotomo@gmail.com
Tel*: +62 811-251-037

Abstract
Surrealism has grown since 1924 – 21 years before the Republic of Indonesia was founded. Yet this art movement has found fertile ground in Indonesia. Art communities in the country have well-embraced keywords associated with Surrealism, such as automatism, chance, unconscious, dream world, and juxtapositions. After doing literature studies and observing the works projected for the 100 years of André Breton's surrealism exhibition at the Oei Hong Djien Museum, to open in October 2024 until February 2025, we have found there are more important points of Surrealism that have been missed to infuse into the curatorial writing for enhancing the exhibition.

Keywords: André Breton's tenets; revolt arts; Indonesian art

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6153

1.0 Introduction

The Surrealist Manifesto was introduced in Paris by André Breton and his colleagues in late October 1924. At the time, the Republic of Indonesia did not exist yet; it was still Netherland's Dutch East Indies, whose capital was Batavia. The Proclamation of the Republic of Indonesia took place on 17 August 1945, yet the Netherlands just transferred the sovereignty to the Republic of Indonesian States on the 17th of December 1949. Less than three weeks the newly founded Republic of Indonesia (RI) founded the Academy of Visual Arts Yogyakarta (ASRI Yogyakarta), through which knowledge, discourses, and information of art transferred and developed, including Modern Art. Surrealism was one of the art movements of modern art, it is still considered to have equal significance as romanticism of the 19th century. Surrealism actively characterized the constellation of the art world from 1924 until its leader, André Breton, died in 1966. We intend that Surrealists' habit of writing and publishing articles on their art world could motivate art communities to do so..

Marianto (1993) describes that surrealism art began to squirm, attract attention, and became one of the popular choices for fine art in the 1970s. Surrealism art significantly colored the art world in Yogyakarta in the 1980s. Yogyakarta, at the time, had become one of

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6153

the country's art centers where many artists and art students from many parts of the country. ASRI Yogyakarta which became STSRI "ASRI" Yogyakarta, a college of visual arts, provided art education to students from provinces across the country (now the college had become the Faculty of Visual Arts of Indonesia Institute of the Arts Yogyakarta – ISI Yogyakarta). The college had a staff member named Sudarso Supadmo who translated and published several modern art books into Indonesian and published pre-books and books on ancient Indonesian art. Many of the *civitas academica* of STSRI "ASRI" Yogyakarta and other education institutions used and learned modern art from translations by Supadmo and some books imported from the USA and the UK.

In short, study materials on surrealism were available for lecturers and students. However, in those times, many people often said that the studio work and the end-products of art were more important than theories of discourses of art. In this sense, the habit of reading and the desire to delve into theoretical material from written sources have not yet developed. Theoretical materials and the value of theory courses seemed to still be subordinate to the value of practical classes or studio work. Most students are still more interested in pictures and visual illustrations than the content of the text. Reproductions of surrealists such as Max Ernst, Juan Miró, Méret Oppenheim, René Magritte, Marc Chagall, Marcel Duchamp, and Salvador Dali were the favorite works of art learners. It is significant to note that when discussing surrealism, many people connected only certain words or chunks of knowledge to it, such as Freud's concept of the unconscious and subconscious, automatism, chance, juxtaposition, and imagination. Surrealism art became synonymous with works that look absurd, strange, and incongruous, with a situation or condition with a quiet and haunted look, or as a deserted space.

Through a literature study, this research aimed to discover other words, points, advocacies, or thoughts of Breton's surrealism, which might have been misread or neglected. The study's objective is to understand essential points of Breton's Surrealism tenets to use in selecting the works of art for the exhibition, preparing the curatorial wall text, and writing the post-event catalog/book. The results were words, phrases, or visions on surrealism to prepare a post-exhibition text so that later, the exhibition of 100 Years of André Breton's surrealism at the Oei Hong Djien (OHD) Museum not only presents curated Indonesian surrealism works but also produces writing that could revibrate understandings and knowledge of surrealism, which may have become cliché or too literary.

2.0 Literature Review

2.1 Surrealism

Short (1966) states that surrealism was a political movement; participated by a hundred writers and artists, in the period between World War I and World War II. They had the most influence on the intellectual climate of that period compared to any other movement. What is significant here is that Short's point that surrealism was also important in shaping the intellectual atmosphere among the people of that period.

Polizzoti (2024) affirms that Surrealism is a continual movement; echoes of radical and critical voices continue to echo everywhere until now as a criticism of social and political life. Its strength is that journal texts are circulated everywhere and translated into many countries, fostering the intellectual consciousness of individuals and society at every age and in every country (Polizzotti, 2024) (Levett, 2024).

Automatism, chance, the omnipotence of dreams, and sub-consciousness are terminologies offered by Breton (as cited in Rosemont, 1978) for surrealism. It is the moral honesty and artistic integrity of the artist, with which one truly expresses the *rasa* (sense of feeling) of something he feels the most, in order to obtain the most important effect, which is something that he digs out of the subconscious world with consciousness. Breton's idea on surrealism (as cited in Rosemont, 1978, p. 317) states: "*Surrealism* is not a new or an easier means of expression nor even a metaphysics of poetry. It is a means of total liberation of the mind and *of all that resembles it*."

The ideas for surrealism came from some of Breton's predecessors. The word "surrealism" was revived as a new word (neologism), meaning "more than reality". In this context, surrealism is a new way or view of the world in which surrealists propose something new. To bear novelties, the surrealists pay essential attention to the word: "çhance," which appears casually (unplanned) (Rosemont, 1978). Its origin came from the word "sur-reality" once used by the famous poet and writer Guillaume Apollinaire (1880-1918), meaning extraordinary reality (Hughes, 1991, p. 213).

Free chatter was also a significant activity amongst the surrealists to enrich the sense of art. They walked around Paris to discuss by cynicism the buildings, sites, and significant centers they passed by; and laughed at the places that had become popular tourist sites and academic education centers. These activities were meant to condition themselves for having intense and engaging contact with daily life (Hughes, 1991). With such a concept in mind, they saw the critical conversations between them, wandering around the streets of Paris, and discussing the city's urban situation as important happenings; either an art practice or an aesthetic activity, and even as an art form that reveals any possibilities of surrealism (Marshall, 2023)

Surrealism focused on the dream world to prepare for a new reality that transcends reality and unreality. André Breton was so inspired by Sigmund Freud's psychoanalysis theory; he was so interested in Freudian concept of the subconscious, the id, and free association analysis. Nevertheless, Breton refused Freudianism; for example, in psychoanalysis, Freud intended to cure neurosis, while Breton saw it as an essential mental instrument (Hughes, 1991). Interestingly, Fenton (2004) writes that surrealism interest was to counter worldwide capitalism.

2.2 Surrealism Outside France

Kiejziewicz (2017) in her article writes that surrealism reached Japan in 1926, not long after surrealism was launched by Breton; surrealism writings were brought by the poet Junzaburō Nishiwaki. However, when surrealism emerged among Japanese artists in the

1920s, the community had a solid nationalistic sense of art; they were determined not to merely adopt Breton's surrealism but adapt it to Japanese conditions by incorporating local myths and beliefs in creating surrealist art. From her description, it is worth mentioning that the idea of surrealism migrated to Japan soon after its emergence.

Tailanga (2008) describes that surrealism also grew and developed in Thailand in the 1960s in fine arts, literatures, and films. The information and visuality of France surrealism they get from the history of modern art and from books imported into Thailand, socialized and spread through art education institutions. Artists, writers, and filmmakers welcome forms and techniques. Therefore, through the surrealistic works that develop, we can say that there is misreading and misinterpretation of the essence of surrealism. As a result, the philosophy and ideology of surrealism that was fought for and socialized by the writers, and followers of French surrealism were not well socialized, even considered the best by Thailand surrealists.

Fu (2022) says that many surrealist painters emerged in China. Those artists also used the unique artistic techniques of the surrealist school and the Chinese style of surrealist art to create their art, showing an art style and style that is increasingly popular among the Chinese. Fu writes "surrealism broke the shackles of traditional painting and enriched the language of surrealist painting with a variety of methods such as 'collage' and 'printmaking', giving off a more brilliant artistic light" (p. 16).

Marianto (1995) specifically discusses surrealism in Indonesia. The issue of surrealism has not become a discourse in the art community in academic and non-academic institutions, at least until the end of the second half of the 1960s. Around Indonesia's Independence, the artists are still busy with the issues of seizing Indonesia's independence and forming the national identity of the State and Nation of Indonesia. In the 1950s, ideological divisions between artist groups and artists' organizations emerged due to the *cold war* between the Eastern Bloc led by the PRC and the Soviet Union, and the Western Bloc led by the USA and the United Kingdom. Some works that present surrealism have begun to appear, for example, in some works by Harjadi and S. Sudjojono. In the 1960s, the contrasting ideological teachings between the Eastern group (communism) and the Western group (universal humanism) was founded. The ideological feud that affects the world of artists, culturalists, and intellectuals, as well as the military constellation, culminates in political, social, and humanitarian conflicts that are not over until the dissertation is completed. Marianto wrote that surrealism that emerged and was discontinued through art lectures, at least at STSRI "ASRI" Yogyakarta, has triggered the emergence of various kinds of surrealism that have been internalized through stories, legends, and local myths, as well as puppet performances where juxtapositions from the world of consciousness, the subconscious world, and the absurdity of daily socio-cultural life are symptomatic. Here, Marianto exposes and discusses several surrealistic works that, according to him, are directly or unaffected by the environment and the discourse from which surrealist works emerge.

As a closing point in this section, we formulate that surrealism is so attractive, inspirational, adaptable, and transformative that its popularity makes André Breton's thoughts and vision worthy of observation. Here, we can paraphrase his thought, that: by or through poetic means, the capacity of human thought can overcome and transcend the conventional limits of ordinary thought; art and life can complement and enliven each other by tapping or greeting areas of the mind that are often ignored or forbidden (Hughes, 1991).

2.3 Surrealism Beyond Borders

D'Alesandro shows that Surrealism has already expanded to various cities on the existing continent; have vitality and emerge through various unique or particular social, cultural, and political conditions and circumstances; presenting local potentials where Surrealism grows whose concept and appearance are also different from Paris Breton Surrealism; as if it has become new kinds of surrealism ((D'Álesandro, 2021)

3.0 Methodology

In seeking and adapting significant points from Breton's thoughts and teachings which might have been missed or neglected to enrich the literacy about surrealism to the art public through the exhibition text, we borrow findings from Chen and Pan (2024). They write that the translation of Parisian surrealism texts into Chinese has contributed significantly to the modernization of Chinese art. Through these translation efforts, young artists as translators express their pioneering art concepts through translation whilst expressing their own desire to become 'reformists' of Chinese art and at the same time, be 'mediators' who bridge modern Chinese and Western art. They point out that the translation ultimately conceptualized an unprecedented 'Chinese surrealism,' which was very different from the original Western surrealism.

In this research, we observe surrealistic works of around 65 artists that will contribute to the exhibition at the OHD Museum. The artists selected come from different regions in Indonesia, such as Mahdi Abdullah (Aceh), Dicky Takndare (Papua), M. Muklis Lugis (Makassar), Nyoman Masriadi (Bali), Diah Yulianti) South Kalimantan, Eddy Sulistyo (Yogyakarta), Lenny Weichert (Jakarta), Venzha Christ (Banyuwangi), F. Sigit Pramono (East Java), and Mella Jaarsma (expatriate artist from the Netherlands). To choose the significant points from the reading materials. This research use Hans Georg Gadamer's Hermeneutic theory as one of the methods of understanding, as written in a book by Hardiman (2015), as productive hermeneutics. In interpreting these quotes, we fuse André Breton's horizon and the horizon of selected surrealist whose works of art would be present in the exhibition. We observed the sample artists work to see whether they accommodated local or ethnic storytelling or mythologies or not. The reasoning is that many local legends and storytelling often depict or tell something absurd and seemingly irrational. We also interviewed them to find out what they thought about Breton Surrealism or surrealism they thought.

4.0 Findings

Breton was an inventive thinker, poet, writer, and artist, perceptive and morally well. He believed that art not only has vitality but also has the power to change lives. (Hughes, 1991, p. 212). This information states that Breton is a person who has multi-skills in making art, writing, lecturing, conceptualizing, and conceptualizing various things related to art, culture, and politics. One of the Indonesian modern art founders, namely S- Soedjojojo, whose early works of art depict human activities in surreal landscapes and atmospheres, not only painted but also wrote articles criticizing socio-cultural lives with static systems of aesthetics (Spanjjard, 2018).

Breton advocates that to generate new ideas in the context of Surrealism; we should understand that art and life are two entities that can complement and strengthen each other. To do so, we could contact forbidden areas or unthinkable spots in the unconscious (Hughes, 1991, p. 213). He also writes that Breton asserts the significance of freedom of speech and of interpretation to free man from the confines of logic, morality, and vested interest; therefore, man can recover their genuine spirit.

In view of André Breton, surrealism is not an easier way or approach to art, and neither is metaphysical poetry; rather, it is a way to free the mind from its confinement. In the realm of praxis, surrealists developed walking around the streets of Paris, to stop and discuss places, buildings, or centers of urban activity critically and with cynicism to express their anti-global-capitalism stand. For them, such free talk is very important as it involves practical art and, at the same time, aesthetic activities. From interviewing samples of respondents of artists, art students, and art teachers, we found that many still thought that surrealism was a style to create absurd, irrational: or randomly juxtaposed images with a deserted and empty atmosphere.

5.0 Discussion

In an interview with André Breton not long before he passed away, Franklin Rosemont noted that Breton once confirmed surrealism had existed before him. He was confident that surrealism would last continuously (Rosemont, 1978). This means that there had been surrealist works before the Surrealism of Breton, as long the artist applies automatism in exploring ideas from imagination, the sub-conscious world, and dreams without any filtering of logic and rationalism.

Breton's statement that surrealism will continue, despite its ups and downs, has at least proven that his writings have been translated into various countries, including Japan and China (Wu, 2014; Chen & Pan, 2024). Surrealism is included in a book by Honour and Fleming (2005), which says that the purpose of surrealism, the explanation, with photographs of some prominent surrealist figures' works are proof that surrealism continues to live and develop. Supadmo (1993) in his article, "Surrealisme Indonesia: Bentuk dan Motivasi Kelahirannya" [Indonesian surrealism: Form and the motivation for its birth], writes about the development of surrealism in Indonesia. While in Australia, Ades (1993) also expresses her idea regarding surrealism in her essay, "Surrealism as Art." The fact we are now at the final stage of exhibiting at the Indonesian surrealism exhibition proves that surrealism is growing.

Surrealism is a movement of artists and intellectuals whose ideology was against bourgeois and global capitalism (Short, 1966; Fenton, 2004; Honour & Fleming, 2005). It can therefore be assumed that the writings and lectures must have influenced the thinking of many people in France and outside France, including the texts translated into English, Japanese, and Chinese that had a significant impact. The conclusion is that surrealism is more concerned with the way of view, attitude, or practice in daily life, it does not focus on pure art and aesthetics.

Surrealism by Breton and his colleagues is not to find a style or visual system to make it easier for people to do art, but rather to be flexible and willing to think that does not only focus on mere rationalism, but also greets and embraces the underworld, imagination, and dream world through automatism to find new possibilities and increase probabilities in generating new ideas.

Surrealism underlines concrete activities, praxis involved in daily real life is an attitude and way of life to concretely express various ideas and concepts obtained from exploring the world of dreams, the unconscious, and imagination to be realized through real works that are material, media, and the way they are constantly moving and changing, such as dreams, imagination, and the underworld that are constantly changing into anything.

6.0 Conclusion & Recommendations

Surrealism is not a style, formula, or way to create art that looks absurd, strange, or awkward, but rather an approach to seeking new ideas, new perspectives, or new understandings of reality. .

André Breton, a poet, writer, artist, and speaker, stated that thinking is not enough only by relying on rationality or being anchored to narrow and linear logic but must also appreciate and greet the world of dreams, the subconscious, imagination, in order to present something beyond realism or logics because the world of dreams, the subconscious, and imagination contain any possibility and probabilities.

The perspective suggested by Breton is the same as the way of thinking of creative people in the past or present who composed stories, wrote metaphors, and built transcendental or monumental works. Their creative or innovative ideas must come from various sources that are presented in a dynamic, zig-zag, non-linear manner through imagination, openness, and mental flexibility in thinking, experiencing, and re-expressing them through a transformative process.

Breton's approach through automatism, free juxtaposition, chance, imagination, exploration of the underworld, and dream exploration concocted for surrealism proved very influential and attractive to many artists, poets, writers, and creators in various countries around the world.

No less critical is Breton's thought that art and life can complement each other and make a living. This teaching is very relevant for today's life, where people are increasingly aware that everything turns out to be interconnected and mutually influencing.

His contributions and dissemination of ideas through Breton's lectures also need to be appreciated and emulated, for the development of art and human civilization. Breton transformed the pessimism, skepticism, and anti-rationalism of the Dada movement, which grew rapidly due to the disappointment of the First World War, through thoughts and wisdom into a surrealism that was constructive, critical, and inspiring. We will apply these facts, discourses, and information to enrich the exhibition's textual publication, as well as to enhance the exhibition of a century of André Breton's surrealism at the OHD Museum.

Nevertheless, this research did not include any question to investigate how artists and academicians in some art institutions understood Surrealism whether as a style or as an awareness in exploring new and fresh ideas. This issue will be a significant topic to study.

Acknowledgement

We would first like to thank the OHD Museum management for showing us a number of surrealistic works from the museum to observe. Additionally, we would also like to thank the Sangkasa Gallery for providing visual data and information on young surrealist artists' works.

Paper Contribution to Related Field of Study

This paper provides additional, or underlining, specific material on the points of André Breton's teachings and thoughts on knowledge and discourse, which are rarely discussed among Indonesian surrealists and the art public.

References

Ades, D. (1993). Surrealism as art [Essay]. In M. Lloyd, T. Gott, & C. Chapman (Curators), *Surrealism: Revolution by night* [Exhibition catalog]. National Gallery of Australia.

Chen, Q., & Pan, H. (2024). Conceptualizing 'Chinese surrealism' through translation: A case study of the China independent fine arts association's cultural identity and its translation of surrealism in 1930s. *Perspectives*. https://doi.org/10.1080/0907676X.2024.2332433
(Levett, 2024)

D'Álesandro. (2021). *Surrealism Beyond Borders.* New Haven: Yale University Press.

Levett, A. (2024, May 14). "All of This, My Dear Sir, Is Surrealism: On Mark Polizzotti's Why Surrealism Matters". *Los Angeles Book Review LABR*.

Polizzotti, M. (2024). *WHY SURREALISM MATTERS.* New Haven: Yale University Press.

tailanga, S. (2008). Modernist Thai Short Stories. *MANUSYA: Journal of HHumanities*, 125-141.

Fenton, J. (2004). "A world where action is the sister of dream": Surrealism and anti-capitalism in contemporary Paris. *Antipode*, *36*(5), 942-962. https://doi.org/10.1111/j.1467-8330.2004.00462.x

Fu, Z. (2022). Art in the dream world - surrealism. *Highlights in Art and Design*, *1*(1), 14-16. https://doi.org/10.54097/hiaad.v1i1.1564

Hardiman, F. B. (2015). *Seni memahami: hermeneutik dari Schleiermacher sampai Derrida* [The art of understanding: Hermeneutics from Schleiermacher to Derrida]. Kanisius.

Honour, H., & Fleming, J. (2005). *A world history of art* (7th ed.). Laurence King.

Hughes, R. (1991). *The shock of the new: Art and the century of change*. Thames and Hudson.

Kiejziewicz, A. (2017). From France to Japan. Migration of the surrealist ideas and its influence on Japanese avant-garde film. *"Maska," 36*, 111-122. https://maska.psc.uj.edu.pl/documents/40768330/43096068/Maska_36.pdf/

Marianto, M. D. (1995). *Surrealist painting in Yogyakarta* [Doctoral dissertation, University of Wollongong]. https://ro.uow.edu.au/theses/1757/

Marshall, A. (2023). Walking for revolution: From surrealism to the situationist international. *New Readings, 19*, 19-42. https://doi.org/10.18573/newreadings.138

Rosemont, F. (Ed.). (1978). *André Breton. What is surrealism?: Selected writings*. Pluto Press.

Spanjaard, Helena (2018), *Cita-Cita Seni Lukis Indonesia Modern 1900-1995*. Yogyakarta: Ombak.

Short, R. S. (1966). The politics of surrealism, 1920–36. *Journal of Contemporary History, 1*(2), 3-25. https://doi.org/10.1177/002200946600100201

Supadmo, S. (1993). Surrealisme Indonesia: Bentuk dan motivasi kelahirannya [Indonesian surrealism: Form and the motivation for its birth]. *Jurnal Pengetahuan dan Penciptaan Seni*, *3*(4).

Tailanga, S. (2008). Modernist Thai short stories, 1964-1973: The relationship with art. *Manusya, Journal of Humanities, 11*(2), 125-141. https://digital.car.chula.ac.th/manusya/vol11/iss2/7

Wu, Chinghsin. (2014). Reality within and without: Surrealism in Japan and China in the early 1930s. *Review of Japanese Culture and Society, 26*, 189–208. https://doi.org/10.1353/roj.2016.0010

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Royal Influence: Reviving the Tenun Pahang Diraja weaving industry in Pahang

Mas Ayu Zainal @ Ismail[1,2*], Siti Rohaya Yahaya[1] , Nani Hartina Ahmad[3]
*Corresponding author

[1] Universiti Sains Malaysia, Malaysia
[2] Universiti Teknologi MARA, Kedah Branch, Malaysia
[3] Universiti Teknologi MARA, Kelantan Branch, Malaysia

masay826@uitm.edu.my, ysrohaya@usm.my, nanihartina@uitm.edu.my
Tel: +60162220551

Abstract
This study examines the historical development of Pahang's weaving industry and the influence of the Royal Institution. With a 300-year history, this industry is vital to Malay cultural identity. Utilizing qualitative methods, the research highlights the pivotal roles of HRH Tengku Ampuan Meriam and HRH Tengku Puan Pahang Tunku Hajah Azizah in the industry's revival and growth. The conferment of the "Diraja" title in 2006 reinforced its cultural significance. This research underscores the enduring importance of Tenun Pahang Diraja (TPD) in Pahang's cultural and economic landscape.

Keywords: Tenun Pahang Diraja; weaving; craft

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6165

1.0 Introduction

The origin of TPD fabric is uncertain, but it is believed to have spread with the arrival of a Bugis nobleman, Keraing Aji, in 1722, who sailed to Pahang and introduced weaving patterns for sarong and samping (Zakaria Hitam, 1989; Linehan, 1973). Consequently, TPD became a significant part of Pahang's merchandise. Known for its exceptional quality and fine silk threads, the fabric became the attire of choice for royal ceremonies and official events among royals, noblemen, and gentry. It was also commonly presented as gifts to high-ranking Malay dignitaries and foreign acquaintances (Zainal Abidin Borhan, 2009).

TPD's cultural significance continued into the 20th century. Traditionally, it is used as part of a Malay wedding dowry, to swaddle newborns in welcoming ceremonies, as attire for boys in circumcision ceremonies, for new mothers during confinement, and as a shroud for the deceased (Zainal Abidin Borhan, 2009; Mohd Yusof Abdullah, 2009; Norwani Md. Nawawi; Rafeah Legino, 2016). The weaving industry attracted attention from various government agencies, including the Malaysian Handicraft Development Corporation (MHDC), the Pahang Department of Museums, and the Pahang State Government, leading to the establishment of weaving centers in places like Felda Chini 5, Rompin, and Kampung Sungai Soi, Kuantan.

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6165

Weaving, once a primary source of income for Malays, faced decline due to historical events such as the Pahang civil war and the Japanese invasion during World War II, which disrupted silk supplies. However, HRH Tengku Ampuan Besar Pahang, Tengku Meriam played a pivotal role in reviving the industry with support from government agencies like the Rural Industrial Development Authority (RIDA), the Southeast Pahang Development Board (DARA), and MHDC, along with weaving training programs to attract younger generations.

HRH Tengku Puan Pahang, Tunku Hajah Azizah Aminah Iskandariah, has continued this legacy, demonstrating her commitment to preserving and strengthening the TPD industry. Her hands-on involvement with weavers and dedication to promoting "intangible heritage" are highly valued by the people of Pahang (Ahmad Farid Abdul Jalal, 2013c). Her efforts have elevated Tenun Pahang to its current prestigious status, showcasing the Pahang Royal Institution's ongoing support for the weaving community and national heritage. This research delved into the influence of Pahang Royal Institution on the growth of weaving industry in the state of Pahang. Its goal is to provide the community a better understanding of the weaving industry in the state, so that the legacy left by our forefathers receives greater respect and appreciation.

Fig. 1: Beragi Pattern
(Source: Yayasan Tenun Pahang Diraja [@yayasantenunpahangdiraja], 2020)

2.0 Literature Review

2.1 The History of Weaving Industry in Pahang

Historically, weaving is one of the oldest activities that accompanied the development of human civilization (Habibah Abdul Jabbar et al., 2015; Norwani Md. Nawawi, 2022). According to Zainal Abidin Borhan (2009) and Nasha Sharieyna Dzulkarnain et al., (2021), the meticulous craftsmanship of woven cloth symbolized the greatness and sovereignty of Malay rulers. Influences from China, India, and Arab further enriched the style and fashion of local weaving.

The Malay Peninsula's strategic location between two major trade routes, the Indian Ocean (West) and the South China Sea (East), attracted traders and significantly impacted the Malay economy, politics, and society. Trade relations flourished in the 15th century, and the blending of foreign cultural elements influenced the Malay community, including weaving. The arrival of Keraing Aji, also known as Tok Tuan, and his followers in Pahang marked a new era in weaving. The Bugis brought patterned woven fabrics, which spread to Terengganu and Kelantan (Nor Hanim Awang @ Mohd Noor, 2021), where local weavers developed new patterns, although the traditional Bugis method remains practiced in Pahang (Azizah Mahmood Iskandar and Ahmad Farid Abd Jalal, 2017).

The weaving industry in Pahang gained further momentum with the opening of Singapore Port in 1819, which facilitated the import of raw materials like cotton threads from England and silk threads from China. Weaving thrived in Kampung Mengkasar and surrounding areas such as Pulau Keladi, Kampung Jambu, Kampung Benta, Langgar, and Ketapang. During his 1838 visit to Pahang, Munsyi Abdullah described weaving as one of the state's main economic activities, reflecting Keraing Aji's success in inspiring local interest. However, the industry declined from 1857 due to the Pahang civil war, which lasted until 1863. Despite this, woven products remained popular among the nobility for ceremonies and official events, symbolizing authority and prestige for Malay royals and courtiers.

2.2 Involvement of The Royal Institution in The Growth of TPD

The royal institution plays a crucial role in traditional Malay culture, serving as a center for knowledge, literature, arts, culture, and religion (Siti Mariani S.M. Omar, 2002; Azizah Mahmood Iskandar; Ahmad Farid Abd Jalal, 2017; Ahmad Farid Abd Jalal, 2022). According to *Hikayat Anggun Tunggal* (Siti Zainon Ismail, 1986), woven fabrics have long been the attire of Malay royalty. The sultans of Pahang have worn TPD as their official attire at significant events, showcasing the tradition of wearing TPD with pride—a custom that persists among Pahang royalty to this day.

Fig. 2: HRH Tengku Ampuan Besar Tengku Meriam binti Sultan Abu Bakar
(Source: Sahaimi Abd. Manaf et al., 2006)

In 1903, the weaving activities of Malay women in Pahang caught the attention of English Resident Cecil Gray. Despite efforts to engage the younger generation, interest declined, prompting Gray to seek support from the palace through Tengku Ampuan Meriam to revive the weaving industry. With the palace's sponsorship, the art of weaving in Pahang was revitalized and remained vibrant into the 1920s. Tengku Ampuan Meriam played a key role in this development, making weaving central for women in Pekan. The presence of looms in nearly every household in Kampung Pulau Keladi, Kampung Jambu, and Kampung Benta attests to this success.

The weaving industry's growth drew the attention of the Pahang government, which mandated Malay employees to wear black and white horizontally striped woven samping. To further promote the industry, various incentives were introduced, supported by government agencies such as RIDA in 1963, DARA in 1974, MHDC in 1980, the Pahang State Development Corporation (PSDC) in 1992, the Pahang State Museum in 1986, and the MHDC Pahang Branch in 2002. In 1964, the Pulau Keladi Silk Weaving Institution in Pekan was established as the first weaving training center to encourage youth to learn traditional skills. PSDC further supported these efforts by offering training programs through workshops in Peramu Jaya 3, Kampung Temai, and Sungai Lembing, helping to cultivate new weavers. Renowned weaving masters like Natipah @ Nortipah Abdul Kadir and Azman Zakaria were recruited to share their expertise with young people.

The royal family has played a significant role in sustaining the weaving industry. The 1986 royal wedding between HRH Tengku Abdullah Ibni Sultan Haji Ahmad Shah, Crown Prince of Pahang, and HRH Tunku Azizah of Johor reinforced the weaving tradition, continuing a legacy started by Tengku Meriam's marriage to HRH Tengku Besar Mahmud in 1897, as both princesses were deeply interested in arts and culture.

Tunku Hajah Azizah began her efforts in motif development and contemporary pattern design in 2004 (Dato' Mohd Zubair Haji Mohd Zain, personal communication, November 4, 2022). She worked tirelessly to rejuvenate the TPD industry, gifting TPD to local and international friends and leaders and adopting it as her attire for festive occasions. Numerous meetings with entities like the Pahang State Museum, MHDC Pahang Branch, and the National Craft Institute were held to support this effort.

Her dedication to cultural heritage was crucial in reviving the weaving industry, which had dwindled to just 15 weavers in the 1980s (Zaharah Othman, 2021). Her efforts were so impactful that Sultan Haji Ahmad Shah of Pahang conferred the title "Diraja" on the craft on May 8, 2006, and established the TPD Council, chaired by Tunku Hajah Azizah. Her contributions were further recognized on May 8, 2010, when Malaysian Prime Minister Datuk Seri Mohd Najib presented her with the Special Award (Craft Art) at the Kuala Lumpur Craft Complex for her contributions to the TPD industry.

The involvement of Tengku Ampuan Meriam in 1904 was assisted by two British officers namely Cecil Gray and G.M Laidlaw marked the beginning of the palace's influence. This effort was then continued by the state government in 1928. However, the government still faced a lack of young weavers (Habibah Abdul Jabbar, 2020) and the dominance of weaving from outside (NurulKhasanah Agost, 2021). Tunku Hajah Azizah's visit to Pulau Keladi in 2005 opened a new chapter for this industry. Tunku Hajah Azizah in her speech at the Opening Ceremony of the 8th Asean Traditional Textile Symposium 2022, recalled the moment when she expressed her desire to wear the TPD on the day of the launch of her first cookbook. Since then, various initiatives and development frameworks have been intensified in collaboration with government agencies (Kassandra Kassim et al*.,* 2022) including the establishment of the Institut Kemahiran TPD Tengku Ampuan Besar Meriam (IKTPD), training prison inmates and exhibitions at London Craft Week (LCW).

3.0 Methodology

The findings of this study were obtained through a qualitative approach that focuses on aspects of observation, written sources and interviews based on field studies in several locations around Pahang, Terengganu, Penang, Kuala Lumpur. Field studies and informant diaries were key in data verification. However, secondary sources are also used as references in this writing. The triangulation method is used for accurate and comprehensive data analysis. The purposive sampling method is a basic measure of consideration in the selection of information so that the information obtained is authentic and relevant only as shown in Figure 2.

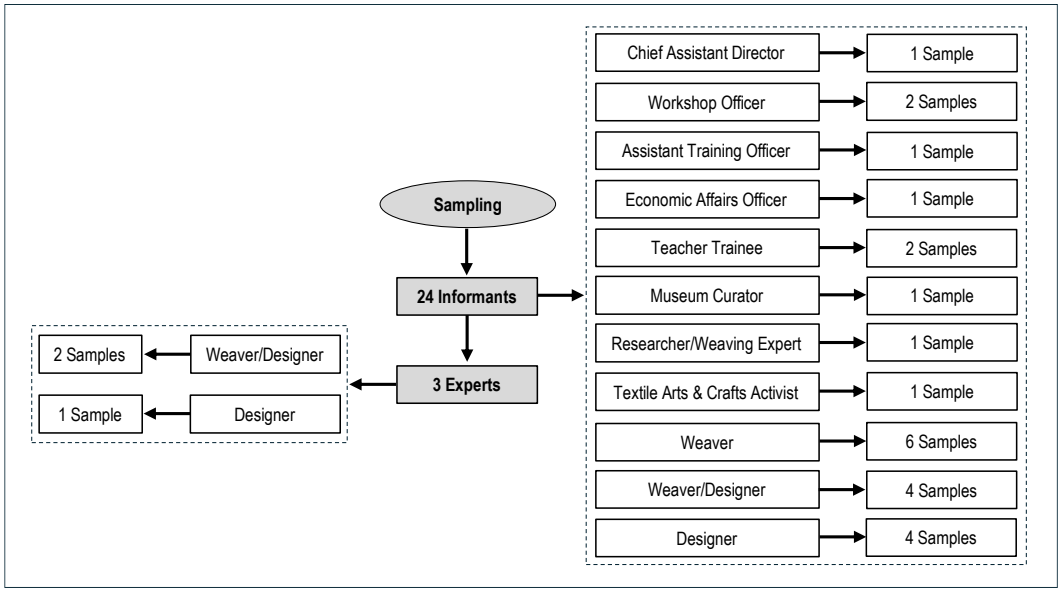


Fig. 3: Sampling and Informants
(Source: Researcher, 2024)

4.0 Findings and Discussion 1: The Role of Pahang Royal Institution

Tunku Hajah Azizah has taken significant steps to conserve TPD over two decades under the patronage of the Pahang Royal Institution. The TPD Advisory Body, established under HRH Sultan Haji Ahmad Shah in 2006, has overseen TPD's growth, reflecting Her Majesty's dedication to this art form. In 2015, Bentong Prison officers revealed that Datuk Mustafa Osman, Chief Director of Penor Prison, envisioned weaving workshops in Penor and Bentong Prisons on August 7, 2006, inspired by Her Majesty's efforts. The workshops started with five inmates and two looms and expanded to 500 trained inmates. On October 15, 2015, the Pahang Royal Institution and the Malaysian Department of Prisons opened the Tenun Bandar Gallery and TPD Resource Center in Kuantan, providing inmates opportunities to earn weaving skill certificates for life after release. During the inauguration of TPDF on April 1, 2018, Tunku Hajah Azizah emphasized:

"The weaving heritage can endure and be disseminated more widely while serving as a branch of occupation if the effort to sustain it continues from one generation to another through the support and attention provided by relevant parties."

A key contribution by Tunku Hajah Azizah was the establishment of IKTPD. HRH Sultan Pahang laid the foundation stone on June 25, 2007, at Kampung Pulau Keladi Cultural Complex in Pekan, Pahang, and Tengku Abdullah inaugurated it on November 20, 2013. By 2022, IKTPD had enrolled 160 students, with 60 completing their studies, ensuring the continuation of this traditional industry by nurturing a new generation of skilled weavers.

Her Majesty also visited weaving centers abroad and participated in seminars and workshops in countries like Thailand, Indonesia, Laos, Vietnam, Brunei, and Cambodia (Ku Mohamad Nasir Ku Mohamad Bashah, personal communication, April 7, 2022). She shared her knowledge and exchanged ideas with local weavers, fostering relationships to elevate Malaysian crafts. As Chairman of the TPDF, Tunku Hajah Azizah has aimed to empower the art of weaving, a key identity of Pahang. This mission gained prominence after her installation as the 16th Queen Consort on July 30, 2019, at Istana Negara. Following the installation, the "Tenun Pahang: Weaving Hope" exhibition at the Malaysian High Commission in London during LCW from May 9 to 15, 2022, showcased TPD internationally, featuring weavings from prisons and Her Majesty's private collection. TPD was featured again at LCW in 2023, with collaborations involving the Ministry of Foreign Affairs, state governments, MHDC, and The Royal Songket of Terengganu.

The 8th ASEAN Traditional Textile Symposium 2022, themed "Celebrating Textiles: A Journey," was held from September 25 to 30, 2022, at the Putrajaya Marriott Hotel, Malaysia. During the symposium, Her Majesty highlighted the importance of preserving arts, culture, and heritage (HRH Raja Permaisuri Agong, 2022). Thirteen ASEAN countries participated, and the foundation has received substantial government support for community development and job creation through TPD.

A special village, Perkampungan Kraf Diraja Tunku Azizah (Tunku Azizah Royal Craft Village), is being established in Pahang to reflect Tunku Azizah's dedication to TPD. Construction began in May 2023 and is expected to be completed in 2024, including facilities like the IKTPD, Cheminahsayang Sdn. Bhd., Queens Hall, and Craft Art Workshop (Fairuz Hafiezal Rosli, personal communication, October 8, 2023).

Fig. 4: Perkampungan Kraf Diraja Tunku Azizah is currently under construction
(Source: Shared by Fairuz Hafiezal Rosli via WhatsApp on October 8, 2023)

Table 1 highlights Her Majesty's dedication to TPD through her active involvement in workshops, seminars, and exhibitions locally and internationally, demonstrating her commitment to its global cultural and economic significance. Her efforts have increased TPD's visibility and facilitated the transfer of skills to younger generations, preserving the craft for the future. Beyond its aesthetic value, TPD represents the historical and cultural narratives of Pahang. The royal support has elevated the fabric's status, making it a symbol of pride, while also exploring its potential for innovation by blending traditional techniques with modern design.

Table 1: Her Majesty's Involvement in the Traditional Heritage Crafts of TPD
(Source: Researcher, 2024)

No.	Date	Workshops/ Courses/ Seminars/ Exhibitions	Venue
1.	25 June 2008	The TPD Event Showcased 92 Fashion Designs from the Malaysian Famous Designers	Kuala Lumpur Complex Craft, Malaysia
2.	25 Nov 2008	TPD Showcased in the Islamic Fashion Festival	JW Marriot Hotel, Kuala Lumpur, Malaysia
3.	12-14 May 2009	Proceedings of the Nusantara Weaving International Seminar: Continuity of Tradition & Culture	Vistana Hotel, Pahang, Malaysia
4.	22 March 2013	IKTPD Collaboration with Malaysian Fashion Designers; Dato' Rizalman, Datin Sharifah Kirana & Jovian Mandagie	The Royale Chulan Hotel, Kuala Lumpur, Malaysia
5.	18-20 Jan 2015	The 5th ASEAN Traditional Textiles Symposium 2015	Payap University, Chiang Mai, Thailand
6.	8-13 June 2015	Short Term Course in Lamphun	Chiang Mai, Thailand
7.	15 May 2016	Bali Weaving Trail: Gringsing Traditional Weaving & *Tenun Imam*	Bali, Indonesia
8.	8-12 Dec 2016	Culture Week of Indonesia, Malaysia & Vietnam	Vietnam
9.	19-23 Nov 2017	The 6th ASEAN Traditional Textiles Symposium 2017	Brunei Darussalam
10.	21-28 Jan 2018	*'Tawaf Tenun'*: Royal Visit	Cambodia & Laos
11.	31 March 2018	TPDF Launch Ceremony	Kuala Lumpur Complex Craft, *Malaysia*
12.	26 Sept 2018	*'Tawaf Tenun'*: Royal Visit	*Kg. Penyabong Acheh (Endau Johor), Pulau Keladi, Temai* & TPD Center – *FELDA, Malaysia*
13.	16-17 Feb 2019	Natural Dyes Creative Workshop	KPKCC, Pahang, Malaysia
14.	18-22 Nov 2019	Limar Workshop	KPKCC, Pahang, Malaysia
15.	9-15 May 2022	LCW 2022	London, UK
16.	25-30 Sept 2022	The 8th ASEAN Traditional Textile Symposium 2022	Putrajaya Marriot Hotel, Putrajaya, Malaysia
17.	19 Feb 2023	HRH Chaired the TPD Development Committee Meeting	Craft Incubator Center, Pahang, Malaysia
18.	17 March 2023	Royal Visit to IKTPD & Cheminahsayang Sdn. Bhd.	KPKCC, Pahang, Malaysia
19.	18 March 2023	HRH, TPDF, Malaysian Handicrafts, Malaysian Prisons Department (Penor & Bentong) to TPD Entrepreneurs and Weavers Meeting Program	Sultan Abu Bakar Museum, Pahang, Malaysia
20.	6-14 May 2023	LCW 2023	London, UK
21.	12 July 2023	Hi-Tea Ceremony (TPD Fashion Show, Tuanku Nur Zahirah Foundation Songket, Pink Jambu Batik & *Telepuk*)	National Palace, Malaysia
22.	5-8 Oct 2023	An Exhibition of HRH Personal Garment and Fabric Collection	Malaysia International Trade and exhibition Cemtre (MITEC), Kuala Lumpur, Malaysia

Fig. 5: HRH Raja Permaisuri Agong Tunku Hajah Azizah (Centre)
During a Special Visit to the United Kingdom
(Source: Tenun Pahang Diraja – Tengku Ampuan Pahang [@tenun.pahang.diraja], 2021a)

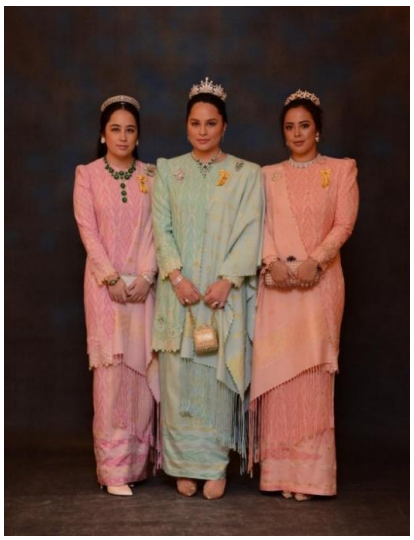


Fig. 6: The Princesses of Pahang Wearing the *Ikat Paku* Technique
(Source: Tenun Pahang Diraja – Tengku Ampuan Pahang [@tenun.pahang.diraja], 2019)

5.0 Findings and Discussion 2: Product Design Innovation

According to Mohd Taib Osman (1984), textiles reflect a society's cultural development. This evolution has led to woven textiles being used not only as body adornment but also in Malay ceremonies and customs. As shared by a TPD Master (personal communication, July 19, 2022), TPD continues to evolve, particularly in manufacturing techniques, patterns, colours, and applications. Patterns are being diversified with contemporary touches, including warp and weft ikat elements, gaining attention among woven fabric wearers (Habibah Abdul Jabbar et al*.,* 2015). Examples include ikat simpul, ikat bersilang, ikat pucuk rebung berlapis (Natipah @ Nortipah Abdul Kadir, personal communication, July 19, 2022), and sapuan (Zulhani Abdul Kadir, personal communication, December 23, 2022).

Zulhani Abdul Kadir (2022) mentioned that the sapuan technique was inspired by HRH Raja Permaisuri Agong, combining her experience and knowledge from 'Tawaf Tenun' visits. Collaboration between the Malaysian Handicraft Development Corporation (MHDC) and the government has further developed and introduced various woven products, aiming to revitalize the Malaysian weaving industry. The vibrant colours and patterns of Pahang woven fabrics lend themselves to diverse uses, including face masks, clutch bags, wall decoration panels, ties, cushion covers, and tablecloths.

(a) (b)

Fig. 7. (a) The Ikat Simpul Pattern; (b) The Ikat Bersilang Pattern
(Source: a. Researcher, 2023; b. Ahmad Farid Abdul Jalal, 2013a)

(a) (b)

Fig. 8. (a) The Pucuk Rebung Bersilang Pattern; (b) The Sapuan Pattern
(Source: a. Ahmad Farid Abdul Jalal, 2013b; b. Shared by Ku Mohamad Nasir Ku Bashah via WhatsApp on April 7, 2022)

(a) (b)

Fig. 9. (a) Ketupat Bags; (b) Face Mask
(Source: a. PKNP Tenun Pahang Soi [@pknptenunpahangsoi], 2019; b. Tenun Pahang Diraja – Tengku Ampuan Pahang [@tenun.pahang.diraja], 2021b)

Fig. 10: The Private Collection of HRH Raja Permaisuri Agong
(Source: Researcher, 2022)

Fig. 11: The Private Collection of HRH Raja Permaisuri Agong
(Source: Researcher, 2022)

6.0 Findings and Discussion 3: Policy, Education and Craft Industry Sustainability

The findings of this study are not only relevant to the TPD fabric industry, but also have far-reaching implications in the context of policy making. The results of the study can be used as a reference for policy makers in formulating better policies especially for traditional craft conservation programs as well as strengthening rural economic development. A more comprehensive policy can be introduced to ensure that the craft industry receives continuous support either through financial assistance, awareness campaigns or incentives for small entrepreneurs.

In addition, this study also opens up space for the introduction of craft training programs in the curriculum of schools and skill institutions. Through collaboration and cooperation between educational institutions and training agencies, this effort can be made part of a strategy and plan in strengthening cultural identity and promoting entrepreneurship among youth. Programs like this can increase the participation of the younger generation, further contributing to the sustainability of traditional culture. The involvement of the Ministry of Tourism, Arts and Culture (MOTAC) and the Ministry of Education Malaysia (MoE) can help intensify the country's craft industry.

7.0 Conclusion and Recommendations

This study examines the influence and role of royal institutions in supporting the preservation of the weaving industry in the State of Pahang. TPD requires effective planning and continuous implementation to ensure its long-term viability in preserving local heritage. However, the results of these findings may need to be adjusted according to different contexts and needs in order to be suitable for the location of the study. The limited sample size is compatible with a qualitative approach to obtain a deep understanding of the phenomenon under study. The purposive sampling method was chosen to ensure a relevant population so that the findings of the study

can be accurately generalized. The applied methodological approach successfully achieved the objective of the study. The same method is also recommended in future research with slight modifications depending on the local geographical and cultural context.

Some suggestions that should be implemented to empower the art of weaving. Among them is introducing specific training programs for the youth as an alternative to increase their participation in the industry. In addition, collaboration with international e-commerce platforms helps expand the local weaving market to the global level while opening greater export opportunities and generating more sustainable returns.

This study also provides a foundation for the implementation of future research, especially in examining the long-term stability of the weaving industry and the effectiveness of modern approaches such as the use of technology and digital marketing to increase production efficiency and productivity. In addition, a comparative study between other traditional crafts in Malaysia or regional countries can also be conducted to see a more effective approach in expanding the global market of local crafts.

All in all, this study has contributed to an in-depth understanding of the TPD fabric and provides practical recommendations in the effort to empower the local craft industry more comprehensively.

Acknowledgments

The authors express their gratitude to the College of Creative Arts, Universiti Teknologi MARA (UiTM) and the School of The Arts, Universiti Sains Malaysia (USM) for their assistance with this research.

Paper Contribution to Related Field of Study

This research not only emphasizes the important role of Pahang Royal Institutions in the development and sustainability of TPD, but it also provides practical suggestions for policy makers to take advantage of the palace's support in promoting traditional handicrafts.

References

Ahmad Farid Abd Jalal. (2022). *A Fashion Tradition.* Pahang State Museum Corporation.

Ahmad Farid bin Abdul Jalal. (2013a). Corak Ikat Bersilang. *Tenun Pahang Diraja: Warisan, Tradisi dan Falsafah*. Pahang: Penerbit Muzium Malaysia Pahang.

Ahmad Farid bin Abdul Jalal. (2013b). Corak Pucuk Rebung Berlapis/Berbalas. *Tenun Pahang Diraja: Warisan, Tradisi dan Falsafah*. Pahang: Penerbit Muzium Malaysia Pahang.

Ahmad Farid bin Abdul Jalal. (2013c). *Tenun Pahang Diraja: Warisan, Tradisi dan Falsafah*. Pahang: Penerbit Muzium Malaysia Pahang.

Azizah Mahmood Iskandar., & Ahmad Farid Abdul Jalal. (2017). *Tenun Pahang Diraja: A Fashion Tradition*. Pahang: Penerbit Muzium Malaysia Pahang.

Habibah Abdul Jabbar. (2020). *Eksperimen Kreatif dan Inovasi dalam Tenun Pahang Diraja* [Doctoral dissertation]. Kuala Lumpur: Universiti Malaya

Habibah binti Abdul Jabbar et al. (2015). Tenun Pahang Diraja: Melestarikan Kesenian Warisan Melayu melalui Aktiviti Tenun dalam Kalangan Banduan. *Proceeding Conference: International Conference on Malay Heritage and Civilisation 2015 (ICOMHAC 2015)*, (pp. 648-660). Pulau Langkawi, Kedah, December 2015

Kassandra Kassim et al. *(*2022). *Tenun Pahang Diraja*. Kuala Lumpur: Unreserved Sdn Bhd

Mohd Taib Osman. (1984). *Bunga Rampai: Aspeks of Malay Culture*. Kuala Lumpur: Dewan Bahasa & Pustaka.

Mohd Yusof Abdullah. (2009). Tekstil Koleksi Muzium Negeri Terengganu. *Prosiding Seminar Antarabangsa Tenun Nusantara: Kesinambungan Tradisi dan Budaya*. Hotel Vistana, Kuantan, Pahang, Mei 2009 (pp. 122-126) Jabatan Muzium Negeri Pahang Malaysia dan Akademi Pengajian Melayu, Universiti Malaya.

Nasha Sharieyna Dzulkarnain et al. (2021), Che Siti Wan Kembang: Songket Seni Tenun Warisan. *Jurnal Sejarah Lisan Malaysia: Sejarah Dan Warisan Negara. Jilid 5 Isu Khas*. Selangor: UiTM Selangor.

Nor Hanim Awang @ Mohd Noor. (2021). Pembentukan Usahawan Kraftangan Wanita di Malaysia: Peranan Sikap, Warisan Keluarga dan Pembudayaan Nilai Agama. *Journal of Malaysia Studies: Kajian Malaysia (Early View)*. Pulau Pinang: Universiti Sains Malaysia

Norwani Md. Nawawi. (2022). *Keindahan Kain Tenun Songket Malaysia.* Kuala Lumpur: Jabatan Kebudayaan dan Kesenian Negara

Norwani Md. Nawawi., Rafeah Legino. (2016). Traditional Songket and Contemporary Designs Towards Commercial Products. In: Abidin S., Legino R., Noor H., Vermol V., Anwar R., Kamaruzaman M. (eds) *Proceedings of the 2nd International Colloquium of Art and Design Education Research (i-CADER 2015*). April 2015 (pp. 71-80). Springer, Singapore. https://doi.org/10.1007/978-981-10-0237-3_8

NurulKhasanah Agost. (2021, June 5). Songket Tenunan Asli Melayu - Dapatkah ia Terus Hidup?. *Berita Mediacorp*. Retrieved from http:// berita.mediacorp.sg/mobilem/gayahidup/songket-tenunan-asli-melayu-dapatkah-ia-terus-hidup/4618548.html

PKNP Tenun Pahang Soi [@pknptenunpahangsoi]. (2019, July 17). *Ketupat* Bags [Photograph]. Instagram. https://www.instagram.com/p/B0AA1MxhX8j/

Sahaimi Abd. Manaf et al. (2006). *Tenun Pahang*. Kuala Lumpur: Perbadanan Kemajuan Kraftangan Malaysia.

Siti Mariani S.M.Omar. (2002). *Warisan Manuskrip Melayu: Satu Pengenalan*. Kuala Lumpur. Perpustakaan Negara Malaysia.

Siti Zainon Ismail. (1986). *Rekabentuk Kraftangan Melayu Tradisi*. Kuala Lumpur: Dewan Bahasa dan Pustaka.

Tenun Pahang Diraja – Tengku Ampuan Pahang [@tenun.pahang.diraja]. (2021a, October 14). *Tenun Pahang di Persada Dunia* [Photograph]. Instragram. https://www.instagram.com/p/CU_5ivVNkZw/

Tenun Pahang Diraja – Tengku Ampuan Pahang [@tenun.pahang.diraja]. (2019, August 4). *Puteri-puteri Pahang Pada Hari Banquet Istana Negara Minggu Ini. Semua dalam Teknik Ikat Paku Tenun Pahang Diraja, dari Penjara Penor* [Photograph] Instragram. https://www.instagram.com/p/B0uhVEtFuwI/

Tenun Pahang Diraja – Tengku Ampuan Pahang [@tenun.pahang.diraja]. (2021b, December 31*). Face Mask Fabric* [Photograph]. Instragram. https://www.instagram.com/p/CYJXWbOlBnq/

Tunku Hajah Azizah Aminah Maimunah Iskandariah binti Almahrum Al mutawakkil Alallah Sultan Iskandar Al-Haj. (2022, September 26). *Celebrating Textiles: A Journey* [Speech audio recording]. Youtube. https://www.youtube.com/watch?v=TNxLXKG4xMo

W. Linehan. (1973). *A History of Pahang (Reprint Number Two)*. Kuala Lumpur: The Malaysian Branch of the Royal Asiatic Society.

Yayasan Tenun Pahang Diraja [@yayasantenunpahangdiraja]. (2020, September 9*). Tenun Pahang Diraja with Corak Beragi (Beragi Pattern)* [Photograph]. Instagram. https://www.instagram.com/p/CE6UpjIjJpO/

Zaharah Othman. (2021, October 17). Postcard from Zaharah: Reviving the Royal Weave with Passion. *New Straits Times*. Retrieved from https://www.nst.com.my/opinion/columnists/2021/10/737101/postcard-zaharah-reviving-royal-weave-passion

Zainal Abidin Borhan. (2009). Falsafah Tradisi Tenun Alam Melayu. *Prosiding Seminar Antarabangsa Tenun Nusantara: Kesinambungan Tradisi dan Budaya*. Hotel Vistana, Kuantan, Pahang, Mei 2009 (pp. 1-12) Jabatan Muzium Negeri Pahang Malaysia dan Akademi Pengajian Melayu, Universiti Malaya.

Zakaria Hitam. (1989). *Asal Usul Nama Tempat Bersejarah di Negeri Pahang Darul Makmur*. Pahang: Lembaga Muzium Negeri Pahang.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Significance of Art Conservation for the Chairman Figure Sculptures of ISI Yogyakarta's Faculty of Visual Arts

Yohana Ari Ratnaningtyas*, Tambak sihno Purwanto, Luna Chantiaya Rushartono, Geminisya Aldheana Tania

**Corresponding Author*

Art Management Department, Fine Arts Faculty,
Indonesia Institute of The Arts Yogyakarta, Indonesia

yohanaarir@isi.ac.id, tambaksihno@isi.ac.id, taniadhea90@gmail.com, lunachantiaya@gmail.com
Tel: +628122693391

Abstract

The chairman figure sculptures at ISI Yogyakarta's Faculty of Visual Arts have value and meaning for the academic civitas of ISI Yogyakarta. This article explores the importance of art conservation, specifically focusing on the figurine sculpture of the Faculty of Visual Arts Chairperson at ISI Yogyakarta. This research uses a qualitative approach by implementing several data collection techniques: interviews, literature studies, and detailed documentation. Findings show the statue is infected with mushrooms, insect and bird dirt, and minor cracks in some parts. The result is that the preservation of art plays an important role in extending the existing statues.

Keywords: Art conservation; statue; tropical climate; ISI Yogyakarta

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6154

1.0 Introduction

The sculpture represents an institution's values, ideas, and history (Guidieri & Willis, 1983). One of the tangible manifestations of the representation of values and ideas within ISI Yogyakarta is the statue of the Chairperson of the Faculty of Visual Arts. Then, the Chairperson of the Faculty of Visual Arts statue also has a high historical value because it symbolizes leadership and vision within ISI Yogyakarta and the Indonesian art world. This statue is not only an art object but also a representation of the spirit and dedication of the Faculty of Visual Arts leaders to developing fine arts in Indonesia. However, over time, these statues face challenges in terms of conservation.

Art conservation is an urgent topic that needs further exploration in preserving the heritage of ideas. The statue of the Chairperson of the Faculty of Visual Arts, ISI Yogyakarta, as a symbol of the leadership and identity of the ISI Yogyakarta community, faces physical and environmental challenges that can threaten its sustainability. Therefore, a critical research question arises: Does art conservation have an essential role in maintaining the aesthetic, historical, and physical value of the statue of the chairman of the Faculty of Visual Arts, ISI Yogyakarta? Therefore, this article explores the importance of art conservation, explicitly focusing on the figurine sculpture of

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6154

the Faculty of Visual Arts Chairperson at ISI Yogyakarta. The aim of this article is to describe the various challenges faced in the conservation and the impact of conservation on the sustainability and preservation of values. Through this study, awareness of the importance of art conservation efforts can be built in the future.

(a) (b) (c)

Fig. 1. (a), (b) & (c) The Chairman Figure Sculptures of ISI Yogyakarta's Faculty of Visual Arts.
(Source: Purwanto, 2024)

2.0 Literature Review

Several case studies in the same context can provide insights into art conservation studies. For example, Chiara Coletti (2024) identified climate change builds threats to the integrity of cultural heritage. The emergence of agents of deteoriation due to climate change causes degradation of the important value of cultural heritages. Long-term conservation treatment is needed with the aim of maintaining "messages of the past for future generations." In other words, a framework oriented towards future cultural value is needed in the context of conservation of cultural heritages (3279-3284). Several other articles and books published over the past two decades can also be referenced in art conservation. One important source is "Preventive Conservation: People, Objects, Place and Time in the Philippines" by Tse et all (2018) which offer conservation activities have a good impact on cultural objects, but conservation activities must be carried out with a broad and holistic approach that includes objects, people, places and time (Tse et all, 2017).

Scholarly articles such as "Sculpture Conservation: Challenges and Solutions" by H. J. von der Osten (2007) also make an important contribution by discussing the specific challenges faced in sculpture conservation from a scientific perspective. Von der Osten (2007) emphasizes the importance of understanding sculpture materials and appropriate conservation techniques to ensure the sustainability of sculptures in various environmental conditions. In addition, "Advances in Sculpture Conservation Techniques" by M. Williams and S. Brown (2011) describes the latest advances in conservation technologies that can be applied to sculpture, including protective materials and advanced cleaning techniques. The article updates conservation practitioners' knowledge with the latest information on techniques and materials that can extend the life of sculptures. The literature as a whole demonstrates the importance of research and technological applications in meeting the challenges of modern sculpture conservation. Of the various studies on sculpture conservation over the past two decades, none has specifically looked at the importance of preserving the statue of the Chairman of the Faculty of Visual Arts. Therefore, this article specifically discusses the importance of art conservation, the various challenges faced, and the impact of conservation on the sustainability and preservation of the values contained in the figure statue of the Chairman of the Faculty of Visual Arts, ISI Yogyakarta.

3.0 Methodology

This research uses a qualitative approach which is divided into three main stages. **The first stage** is data collection by implementing several data collection techniques: interviews, literature studies, and detailed documentation of the research object. Interviews allow researchers to obtain in-depth data about the research subject (Patton, 2015, p. 43). An interview is a data collection method in which the researcher interacts directly with the resource person to obtain in-depth information about the figure sculpture of the Faculty of Visual Arts chairman at ISI Yogyakarta and its conservation. The interviewee in this research is Mikke Susanto, curator, museologist, lecturer at the Art Management Department, and art historian. He has been involved in several art conservation activities. A literature study is a data collection method conducted by reviewing various kinds of literature, such as books, journals, articles, and other documents related to sculpture conservation, especially those with similar cases to the object of this research. Literature studies provide a strong theoretical basis for scientific research (Creswell, 2014, p. 95). Object documentation is a data collection method that involves observing, recording, and archiving physical evidence of the sculpture of the chairman of the Faculty of Visual Arts, ISI Yogyakarta. Object documentation ensures the accuracy of data obtained from field research (Yin, 2018, p. 122). **The second stage** is analyzing by synthesize the data from object documentation based on the interviewees' opinions and the literature review results. last, **third stage** is display analyzed data into scientific writing.

4.0 Findings

4.1 The Significance of The Sculptures and Their Current Condition

According to Mikke Susanto, the statue of the chairman of the Faculty of Visual Arts, ISI Yogyakarta, was made as a form of respect for the services of the faculty's leaders from various periods, from the Indonesian Academy of Fine Arts (ASRI), the College of Fine Arts, to the current era of the Faculty of Visual Arts. Initially, the statues were placed at the Gampingan campus when the Faculty of Visual Arts was still there. However, along with the faculty's move to the new campus in Sewon, the sculptures were also moved following the change in faculty location. The statues are made of PVC cement. On one of the sculptures are the initials "Eko S 84," which is interpreted to mean that one of the sculptures was made by an artist named Eko S in 1984.

Fig. 2. The artist's initial on the sculpture.
(Source: Luna & Dhea, 2024)

Although the statues of the chairman at the Faculty of Visual Arts, ISI Yogyakarta, have significant historical and artistic value, conservation according to scientific standards has never been carried out. This lack of appropriate conservation efforts can result in the physical degradation of the sculptures. Cleaning by washing the sculptures was carried out in 2020, ahead of a sculpture exhibition at the Faculty of Visual Arts at ISI Yogyakarta. Although this simple cleaning can provide a cleaner and tidier appearance, it is insufficient to maintain the integrity of the sculpture material in the long run. Adequate conservation measures involving various parties are needed to ensure its success.

Based on its historical value and meaning, the statue of the Chairman of the Faculty of Visual Arts at ISI Yogyakarta has an important role in shaping the character of the ISI Yogyakarta academic community. But until now, there has been no serious effort to preserve the physical form of the statue. So the condition of this statue is quite alarming. Direct observation of the statue of the Chairperson of the Faculty of Visual Arts at ISI Yogyakarta shows that the condition is now quite troubling. The visible damage on the statue's surface is clear evidence of the degradation it has experienced over time. One of the most noticeable signs of damage is the appearance of minor cracks on the statue's surface. These cracks, while still in their early stages, have the potential to become more severe if not addressed immediately. In addition, the statue was also infected with mold, which usually grows in damp and poorly protected areas from the weather. Not only does this mold ruin the aesthetics of the sculpture, but it can also accelerate the weathering process of the materials used. Not only that but the sculpture is also exposed to bird and insect droppings, which adds to the complexity of the conservation problem. Bird droppings, which contain acid, can damage the sculpture's surface and accelerate the material's degradation. Meanwhile, insect droppings indicate the presence of insect activity that could cause further damage to the sculpture's structure.

Fig. 3. Statue Degradation.
(Source: Luna & Dhea, 2024)

The degradation of the figure statue of the Chairman of the Faculty of Visual Arts at ISI Yogyakarta is related to the location of the statue. The statue is located under a fairly dense tree, and there is plant vegetation around the statue coupled with climatic and environmental conditions supporting destructive agents' growth. Climatic conditions around Institut Seni Indonesia (ISI) Yogyakarta are tropical with high rainfall. The average temperature ranges from 24°C to 31°C, with humidity reaching 90% or more at night. The area also experiences seasonal winds from the southeast that can reach speeds up to 18 km/h, especially during the dry season from June

to September. These winds cause drier conditions during this period. Motor vehicle emission sources and garbage burning mainly cause air pollution levels in the region. During the dry season, pollution levels tend to be higher as dust particles and pollutants can get trapped in the atmosphere due to the lack of rain that helps to settle pollutants (Iklim Yogyakarta – Stasiun Meteorologi Yogyakarta, n.d.).

The poor condition of the statue requires immediate conservation action. The conservation must use scientifically recognized methods to ensure the statue retains authenticity. Without proper conservation treatment, this statue is at risk of damage that can destroy its aesthetic and historical value. One of the first steps to be taken in conserving this statue is preventive action. Regular cleaning is necessary to remove dirt, such as mold, bird droppings, and insect droppings. This preventive measure keeps the statue clean and prevents further damage caused by these biological agents. In addition, semi-restorative conservation is necessary to deal with structural damage to the sculpture, such as cracks on the surface. This process involves patching or filling the cracks with suitable materials so the sculpture can return to a more stable condition. In addition, environmental control is an important step to slow down the intervention of destructive agents, such as moss, mold, bird droppings, and insects, which can accelerate the deterioration of sculptures.

5.0 Discussion

5.1 Impact of Conservation on the Sculpture's Integrity

Art conservation plays an important role in preserving the value and meaning of artwork, but this activity has the risk of changing the preserved object. According to Brown (2018), art conservation is about extending the object's lifetime and preserving the artistic and cultural integrity inherent in the work. However, in the process, conservatives often face the challenge of deciding to what extent interventions should be carried out without changing the original character of the work. Schaeffer (2020) suggests that in some cases, restoration techniques can cause a change in color or texture that is different from its original condition. This leads to a debate about to what extent conservation is believed to have altered the original work and whether the final result can still be regarded as an authentic representation of the artwork. In this case, it is important to consider that any conservation action brings ethical decisions that can affect public perception and the historical value of the work of art. Based on information from Mikke Susanto, curator, art historian, and lecturer at the Department of Art Administration, Faculty of Visual Arts, ISI Yogyakarta, the conservation of artworks should be carried out by a professional conservator, taking into account the results of studies involving various disciplines. (M. Susanto, personal communication, August 10, 2024).

Preserving an artwork's originality represents a fundamental aspect of art conservation, particularly in the case of culturally significant artifacts such as the Chairman Figure sculptures housed within the Faculty of Visual Arts at ISI Yogyakarta. In the context of art conservation, the term "originality" denotes the objective of maintaining the artist's intended form, materials, and techniques with the greatest possible degree of fidelity. These sculptures must be preserved to continue conveying their historical, cultural, and aesthetic values to future generations (Smith, 2019). However, the challenge lies in the natural process of deterioration that affects all materials over time, with the rate of deterioration being accelerated by factors such as environmental conditions, pollution, and human handling. Consequently, art conservators must achieve a delicate equilibrium between preserving the original artwork and implementing measures to forestall further deterioration. To prevent deterioration without compromising originality, it is essential to possess a profound comprehension of the materials utilized and the factors contributing to their deterioration. However, each conservation effort must be meticulously documented to record the artwork's history, allowing future conservators to understand the rationale behind each intervention and its impact on the piece's originality. By considering these things, conservators ensure that the sculptures endure for future study and appreciation while truly resembling their original form and function (White, 2018).

5.2 Challenges in Sculpture Conservation at ISI Yogyakarta

Implementing effective conservation strategies often faces a range of complex institutional challenges. At the educational level, one of the major challenges is the lack of resources, both in terms of funds and the skilled people who specialize in art conservation. As revealed by Setiadi (2019), institutions are often stuck in other priorities, such as curriculum development and research funding, so attention to art conservation tends to be sidelined. In the context of the Faculty of Visual Arts at ISI Yogyakarta, efforts to prioritize art conservation also face similar challenges in integrating conservation as an integral part of wider art education.

In response to this challenge, the Faculty of Visual Arts at ISI Yogyakarta has taken a progressive step by establishing the Arts Conservation Study Program. The program is designed to address the lack of expertise and raise awareness about the importance of conservation among students and lecturers. According to Hermawan (2020), establishing this study program is a strategic step to address institutional challenges, especially in providing the specialized training needed to care for and preserve the Indonesian art heritage. Thus, these efforts are expected to enhance institutional capacity to implement more effective and sustainable conservation strategies in the future.

5.3 Environmental factors and their impact on the sculpture.

The environment where sculptures are housed is critical to their long-term preservation, especially in academic institutions like the Faculty of Visual Arts at ISI Yogyakarta. The tropical climate of Yogyakarta, characterized by high humidity and temperature fluctuations, presents significant challenges to preserving sculptures. High humidity levels, often exceeding 80%, can lead to the proliferation of mold and fungi on the surface of sculptures, particularly those made of organic materials such as wood or mixed media. Temperature variations, common in the region, can cause the expansion and contraction of materials, leading to cracks, warping, or other forms of physical degradation. Moreover, pollutants in the air, such as sulfur dioxide and nitrogen oxides, can contribute to the chemical

deterioration of sculptures, especially those made from metal or stone. These environmental factors, if not properly managed, can significantly reduce the lifespan of sculptures, leading to a loss of aesthetic and historical value (Johnson, 2019).

In addition to the physical impacts, the socio-cultural environment within ISI Yogyakarta also influences the condition of the sculptures. The high level of human activity within the campus, including frequent exhibitions, workshops, and student interactions, increases the risk of physical damage through accidental contact or improper handling. The lack of adequate environmental controls within the exhibition and storage spaces exacerbates these risks. For instance, inadequate ventilation and lighting systems can further stress the sculptures by increasing exposure to harmful ultraviolet light and creating microclimates that foster A comprehensive conservation strategy that takes into account both the physical and socio-cultural environment is essential to ensuring the sculptures at ISI Yogyakarta are preserved over the long term. The institution's cultural practices and attitudes regarding conservation, in addition to deterioration, all impact how these sculptures are maintained (Brown & Davies, 2020).

5.4 Future directions for art conservation

One of the crucial aspects of the preservation of the figure of the Chief of the Faculty of Visual Arts at ISI Yogyakarta is the application of sustainable conservation practices based on scientific methodologies. In the future, the Arts Conservation Studies Program, Faculty of Visual Arts, Institute of Indonesian Arts (ISI) Yogyakarta, is expected to pioneer the development of a more comprehensive conservation program. The proposed program will involve collaboration between academics, professional conservatives, and students. The program should not only focus on the physical rehabilitation of the figure of the Chief of the Faculty of Visual Arts at ISI Yogyakarta but also include preventive efforts through routine maintenance, environmental monitoring, and public education on the importance of conservation. (Warsono, personal communication, August 12, 2024). In addition, the Arts Conservation Studies Program, the Faculty of Visual Arts, and the Indonesian Institute of Art (ISI) Yogyakarta can be centers of art conservation studies that will strengthen the scientific foundation of any intervention. The study center could be a reservoir for interdisciplinary studies integrating art, chemistry, and material technology knowledge, thus producing innovative conservation techniques that fit the Indonesian cultural context. Given that each artwork has a unique historical and artistic value, a thorough understanding of the materials, methods of manufacture, and the object's history is required before doing conservation. With the presence of this research center, the Arts Conservation Studies Program, the Faculty of Visual Arts, and the Indonesian Institute of Art (ISI) Yogyakarta can be a national and international reference in the preservation of art while protecting the cultural heritage of Indonesia for future generations (Wijaya, 2020; Dewi, 2018).

6.0 Conclusion and Recommendations

The statue of the head of the Faculty of Visual Arts of ISI Yogyakarta preserves historical and aesthetic value. The statue honed its predecessors' efforts to promote visual arts education. However, the statue's condition is not good; its surface has minor cracks, mollusks, and bird and insect dirt. The potential for damage is becoming increasingly intense due to the climate and environmental influences that trigger the acceleration of the growth of destructive agents. If this is left unchecked, it will threaten the physical condition of the statue and will slowly take away the value of the message contained therein. Conservation measures such as cleaning, folding of cracked parts, and environmental control are required to inhibit the growth of destructive agents. With a holistic conservation approach, it is expected to be able to give birth to conservation methods that fit needs and conditions. However, conservation measures against the figure of the head of the ISI Yogyakarta Fine Arts Facility face two major challenges: tropical climate conditions and institutional challenges. The institutional challenge is the lack of a priority scale from the Institute for Conservation Activities. It is an opportunity for the Art Conservation Studies program to make art objects in the Faculty of Visual Arts ISI Yogyakarta environment as learning material and research.

Recommendation, Given the importance of the figure of the head of the Faculty of Visual Arts of ISI Yogyakarta, it is expected that the faculty can make conservation activities one of their priorities. Conservation action must involve a pre-professional conservatory, students, and lecturers from various disciplines. Increased awareness of the entire academic community at ISI Yogyakarta played a major role in the conservation efforts of art at ISI Yogyakarta. The art conservation study program should pioneer the preservation of art objects in the ISI Yogyakarta neighborhood. In addition, the Art Conservation Study Program is expected to be the center of future art conservation studies. Furthermore, the art conservation studies program is expected to be a center for developing art conservation.

Acknowledgments

We thank the ISI Yogyakarta Faculty of Visual Arts, especially the Chairperson, for their support and access to the sculpture. We also appreciate the conservators for their valuable insights and resources.

Paper Contribution to Related Field of Study

This study emphasizes the importance of art conservation within academic institutions, focusing on preserving a significant sculpture at ISI Yogyakarta. The findings highlight environmental threats and the need for proactive conservation to protect institutional heritage.

References

Appelbaum, B. (2007). Conservation treatment methodology. Butterworth-Heinemann.

Brown, A., & Davies, S. (2020). Art conservation in tropical climates: Challenges and strategies. Cambridge University Press.

Brown, M. (2018). Art Conservation and Preservation: Balancing Integrity and Intervention. New York: Routledge.

Charola, A. E., & Lazzarini, L. (2018). Conservation of Cultural Heritage: Key Principles and Approaches. CRC Press.

Clavir, M. (2014). Preserving what is valued: Museums, conservation, and First Nations. UBC Press.

Coletti, C. Climate Change Threats to Stone Cultural Heritage: State of the Art of Quantitative Damage Functions and New Challenges for a Sustainable Future. Heritage 2024, 7, 3276–3290. https:// doi.org/10.3390/heritage7060154

Creswell, J. W. (2014). Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.). SAGE Publications.

Dewi, S. (2018). Teknik Konservasi Karya Seni di Indonesia. Yogyakarta: Pustaka Sanata Dharma.

Guidieri, R., & Willis, S. A. (1983). Statue and mask: Presence and representation in belief. Res: Anthropology and Aesthetics, 5, 14–22. https://doi.org/10.1086/resv5n1ms20166685

Haskins, C. (2015). The role of art in academic institutions. Art Education Journal, 68(2), 34-41.

Hermawan, T. (2020). Pengembangan Program Studi Konservasi Seni di ISI Yogyakarta: Tantangan dan Peluang. Jurnal Seni dan Budaya, 15(2), 45-60.

Iklim Yogyakarta – stasiun meteorologi yogyakarta. (n.d.). Retrieved August 12, 2024, from https://stamet-yogya.bmkg.go.id/iklim-yogyakarta/

Johnson, P. (2019). Environmental degradation of sculptures: A case study of Southeast Asia. Art Conservation Journal, 15(2), 45-58.

Lutz, A. P. (2020). The Impact of Digital Tools on Art Conservation. International Journal of Heritage Studies, 26(7), 660-675. doi:10.1080/13527258.2019.1696150

Pardo-Igúzquiza, E. (2015). The effect of temperature fluctuations on outdoor sculptures. Journal of Cultural Heritage, 16(4), 444-450. https://doi.org/10.1016/j.culher.2015.01.002

Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice (4th ed.). SAGE Publications.

Pearson, C. (2013). Conservation and management of archaeological sites. Routledge.

Price, C. A. (2019). Stone Conservation: An Overview of Current Research. The Getty Conservation Institute.

Rodriguez-Navarro, C., & Van Grieken, R. (1999). The role of humidity in the degradation of limestone in tropical environments. Science of the Total Environment, 227(1-2), 165-176. https://doi.org/10.1016/S0048-9697(99)00032-8

Schaeffer, T. (2020). The Impact of Restoration Techniques on Artworks: A Critical Review. Journal of Art Conservation, 45(3), 312-329.

Schilling, M. R., Von Aderkas, P., & Wachowiak, M. (2021). Advances in the Preservation of Cultural Heritage Using Digital Technologies. Journal of Cultural Heritage, 48, 123-136. doi:10.1016/j.culher.2020.12.001

Setiadi, R. (2019). Tantangan Institusional dalam Konservasi Seni di Indonesia. Yogyakarta: Penerbit Seni Nusantara.

Smith, A. (2019). Modern Materials in Art Conservation: Challenges and Solutions. Journal of Cultural Heritage, 36(2), 174-189.

Smith, R. (2019). The importance of originality in art conservation. Conservation Journal, 22(4), 189-203.

Susanto, M. (2024, August 10). historical background and conservtion effort of chairman figure sculptures of Fine arts faculty ISI Yogyakarta (T. Sihno Purwanto, L. Chantiaya, & G. Adheana, Interviewers) [Personal communication].

Torre, M. (2017). Air pollution and its impact on the preservation of outdoor sculptures. Environmental Science & Policy, 77, 18-26. https://doi.org/10.1016/j.envsci.2017.07.015

Tse, Nicole et all (2017). Preventive Conservation: People, Objects, Place and Time in the Philippines. Studies in Conservation

von der Osten, H. J. (2007). Sculpture conservation: Challenges and solutions. Conservation Science Journal, 15(2), 108-115. https://doi.org/10.1016/j.csj.2007.01.002

White, L. (2018). Documenting art conservation interventions: A guide for conservators. Journal of Preservation Studies, 9(4), 301-315.

Wijaya, A. (2020). Pendekatan Ilmiah dalam Konservasi Seni: Studi Kasus di ISI Yogyakarta. Jakarta: Gramedia Pustaka Utama.

Williams, M., & Brown, S. (2011). Advances in sculpture conservation techniques. Journal of Cultural Heritage, 12(3), 275-284. https://doi.org/10.1016/j.culher.2011.02.004

Worrall, J. (2020). Art and education: A critical examination. Journal of Arts Education, 22(1), 12-29.

Yin, R. K. (2018). Case study research and applications: Design and methods (6th ed.). SAGE Publications.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Strategic Strengthening of the Troso Village Fabric Industry as a Sustainable Fabric Center

Jati Widagdo[1*], M. Rifqy Roosdhani[2], Samsul Arifin[2], Nimas Aulia Pambajeng Miftahunnajah[3]
**Corresponding Author*

[1] Product Design, Islamic University of Nahdlatul Ulama Jepara, Jepara
[2] Master of Management, Islamic University of Nahdlatul Ulama Jepara, Jepara
[3] Economic Education, Semarang State University, Semang, Indonesia

jati.widagdo33@gmail.com, samsul@unisnu.ac.id, rr@unisnu.ac.id, nimaz@mail.unnes.ac.id
Tel: +6285162746148

Abstract
Troso, a village in Indonesia, has excelled in fabric production since the 17th century, selling textiles with motifs drawn from across Indonesia locally and globally. Advancing from traditional Pancal weaving to modern techniques like Non-Machine Weaving Tools (ATBMs) and dinamo-powered methods, Troso's economic autonomy thrives on creativity and cultural heritage. This study explores these methods through qualitative research, emphasizing how these fabrics preserve Troso's cultural identity while driving its economy, illustrating the village's enduring prosperity and job creation.

Keywords: Troso; Indonesia; fabric production; cultural heritage

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6166

1.0 Introduction

Indonesia is a diverse nation with various ethnic groups due to its geographical conditions. Because of its vast geography, Indonesia has a rich and diverse way of life, influenced by the culture of each region as inherited from previous generations. Each ethnic group has its own distinct culture. The term "culture" originates from the Latin word "colere," which means to cultivate and develop (Adzrool et et al., 2023). From the existing understanding, "culture" can also be interpreted as encompassing knowledge, beliefs, art, morals, laws, customs, abilities, and habits acquired by humans as members of society (Adzroolet et al., 2023).

In this discussion, the focus is on the craft of weaving in Indonesian society. Weaving was chosen because it is widely practiced throughout the archipelago, and woven fabric is a heritage passed down from Indonesian ancestors (Sarwono et al., 2023). Weaving is one of the traditional arts that reflect Indonesia's cultural heritage, carrying significant values and meanings about life. For the Indonesian people, traditional weaving is a local cultural asset that signifies Indonesia's unique identity (Adzroolet et al., 2023). Weaving is a craft that produces material (fabric) from threads (such as cotton or silk) by interlacing them across a warp. The weaving process uses specialized equipment called looms (Novia Nur Anisah & Muh Fakhrihun Na'am, 2021). One type of weaving is ikat weaving, which involves forming patterns by tying threads with non-porous ropes, such as raffia or plastic, so that tied areas resist dyeing. The untied

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6166

parts absorb the dye, and the colored threads are woven using non-mechanized looms (ATBM) to create the desired motifs (Misbahul Awang Sakti & Kholis Roisah, 2020).

The existence of woven cloth dates back to ancient times when it was used as an interior element. In Indonesia, various regions, including Central Java, have craftsmen who specialize in ikat weaving. One notable ikat weaving craft village in Java is Troso, located in Jepara. Troso ikat weaving is a traditional art that represents the cultural and historical heritage of the area and has a high value in the global market due to its intricate hand-made production process, which showcases its aesthetic value (Prastika, 2022; Nur Lailatul Maulidiyah & Syafii, 2023). Troso Village is among 12 villages in the Pecangaan sub-district, located 15 km south of Jepara's central city. Many ikat weaving craft centers are established in Troso, and almost every roadside features production sites or showrooms, as a significant part of the village population works as ikat weaving craftsmen (Joko Triyono, 2020; Ismanto, 2016; Sarwono et al., 2023).

2.0 Literature Review

The study conducted by Alamsyah (2014) examined the geographical location of Troso Village as a center of textile production, as well as demographic aspects such as population size, livelihoods, and the village's economic conditions. In addition, the research highlighted the historical development of Troso weaving, from the use of traditional looms like "gedok" to non-machine looms (ATBM). Initially, Troso textiles were used for personal purposes but eventually evolved into an industrial commodity. The study also identified the fluctuations in the development of the textile industry in Troso Village, along with the key supporting factors that played a vital role in the industry's sustainability.

Meanwhile, the research by Asshofi and Mukti (2018) expanded the discussion on Troso Village as both a textile industry hub and a tourist destination. The study explored various aspects of the village, including the educational levels of the residents, the types of textile products produced, the production process, marketing strategies, and the impact of the textile industry on the village's economy. The research emphasized the significant role the textile industry played in influencing the economic development of Troso Village.

Through these two studies, it became evident that Troso Village had substantial economic potential, both in terms of its textile history and traditions, as well as its influence on the tourism and trade sectors.

3.0 Methodology

The study, conducted in Troso, Pecangaan, Central Java, Indonesia, aims to explore the historical and current changes in Troso's ikat weaving culture, including its origins and survival strategies. Using a social science approach with qualitative methods, the research focuses on understanding phenomena through direct interaction and symbolic interpretation. Qualitative research involves studying natural backgrounds with the goal of interpreting phenomena that occur, employing various existing methods (Denzin & Lincoln, 1994; Chariri, 2009; Walidin, Saifullah & Tabrani, 2015; Muhammad Rijal Fadli, 2021). By integrating history, social sciences, and anthropology, the study seeks to provide a comprehensive view of the cultural development and social changes in Troso's ikat weaving tradition.

4.0 Findings

The Troso weaving culture survives and develops due to two factors: internal and external. The internal factors include the economy, tradition, adaptation, and compromise, while the external factors involve support from the government, both personally and institutionally, from the grassroots level to the upper levels of the district, province, and even the country.

The Troso culture endures because the Troso community transforms Troso weaving from a clothing necessity into a trade commodity that enriches their lives. The use of woven fabric for religious activities and rituals makes the Troso community not only creators but also users of their own culture. Furthermore, due to industrial needs, the Troso community adapts to production technology, marketing technology, and prevailing fashion trends. The Troso community, open in its production, adjusts to the behaviors and characteristics of its workers, where the industry prioritizes results over the production process. Additionally, the Troso industry is not resistant to external motifs. On the other hand, external factors such as government regulations regarding the use of woven fabric clearly expand the market share for Troso village woven products, leading to the advancement of the Troso weaving industry. When the industry operates alongside culture, that culture undoubtedly finds it easier to endure.

5.0 Discussion

5.1 History of Weaving Troso

Troso weaving is estimated to have begun around the 17th century during the Islamization of the Mataram Kingdom. Dutch sources confirm that weaving existed since the Dutch East Indies era and continued through the Japanese era, the Old Order, the New Order, and the Reform era (Alamsyah, 2014). Some believe that Troso ikat weaving was introduced alongside the Islamization of the Mataram Kingdom (Azkiyyah, 2019; Ivana Felicia, 2015).

Initially, Troso weaving was a local necessity initiated by Ki Senu and Nyi Senu to meet the needs of Gunardi Singorojo, a scholar spreading Islam in the village (Putri, FF, Widjanarko, D., & Syamwil, R., 2018; Alamsah, 2013; Hamdan Bahalwan, 2021; Rafida Salma et al., 2022). Early Troso weaving motifs included the lompong leaf, pine, and Mantingan gate motifs (Alamsyah & Maziyah S., 2013;

Ivana, Felicia, 2015; Ulumuddin & Sulistiyawati, 2018; Lailatul Maulidiyah & Syafii, 2023; Muhamad Fadhil Indra, 2023). However, in the 1960s, these motifs declined in production due to lack of demand. Nowadays, many ikat motifs are well-known in Troso ikat weaving.

5.2 Troso From Clothing to Economic and Industrial Commodity

Troso ikat weaving initially served personal clothing needs but developed into an economic activity along with increased production (Hendro G, 2000; Felicia Ivana, 2015). In the 1960s, this crop became the main source of livelihood for many people, although local demand limited the market (Alamsah, 2014). The 1970s presented challenges due to limited market reach, leading to local bankruptcies. However, an important collaboration with Balinese craftsmen in the late 1970s, initiated by Kusen, expanded Troso's market significantly. This partnership, as well as the implementation of new motifs inspired by Eastern Indonesian styles, is helping Troso ikat weaving grow rapidly throughout Indonesia and internationally. Despite experiencing setbacks due to the Asian financial crisis in 1997, Troso weavers managed to expand their market to Europe, Malaysia, Singapore, and Italy between 1996 and 2014, thanks to innovations in weaving and market strategies (Alamsyah, 2014; Intikaroh, 2018).

5.3 Make Product Derivative

The Troso ikat weaving industry has expanded its product line to not only include traditional sarongs and headbands but also clothing, uniforms and scarves (Anisah & Na'am, 2021). Recent innovations include soft, flowing goyor sarongs, barong shirts with Balinese mask designs, and SBY shirts inspired by Indonesia's fifth president (Wijanarko et al., 2017; Ambarwati, 2021; Aniskuri & Alamsyah, 2021; Putra et al., 2021). New products such as multifunctional clothing, prayer mats, shawls, headscarves, and home decoration items such as blankets and curtains have been introduced. This development strategy aims to improve existing products and introduce new products to target markets, reflecting the industry's continued growth and diversification.

5.4 Adaptation Loom Technology in Troso Ikat Weaving

Around 1935, the people of Troso Village already possessed weaving skills, using the traditional gedog loom inherited through generations (Hendro G, 2000; Azkiyyah, 2019; Lailatul Maulidiyah & Syafii, 2023). The term "gedog" comes from the sound "dhog-dhok" produced by the collision of wood during the weaving process (Widagdo J, et al., 2022). The gedog loom is typically made of wood and bamboo, using the weaver's body to adjust thread tension. Initially, weaving in Troso was only a part-time activity for personal use.

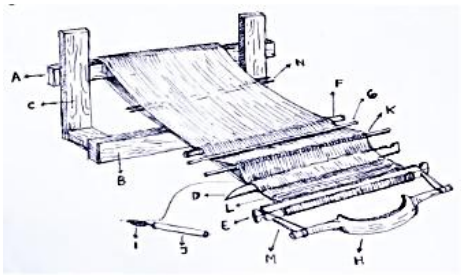


Fig. 1: Maintenance Weaving gedhok
(Source: I Komang Trisnayana, et al., 2016).

As the demand for ikat cloth increased in Troso Village, people began using the faster pancal loom in 1943 (Hendro G, 2000; Alamsah, 2014; Ivana Felicia, 2015; Asrofi & Mukti, 2018; Azkiyyah, 2019; Lailatul Maulidiyah & Syafii, 2023). This loom allowed weavers to not only meet their own needs but also to sell their products locally. In 1946, Troso weavers switched to the non-mechanized loom (ATBM), enhancing production efficiency (Ivana Felicia, 2015; Asrofi & Mukti, 2018). This handloom technology enabled the creation of fabrics from threads like cotton and silk by weaving them transversely (Handayani et al., 2019; Tri Anisih et al., 2024). The advent of handlooms, which were five times more efficient, spurred the growth of home industries specializing in ikat weaving, allowing them to fulfill orders from various regions.

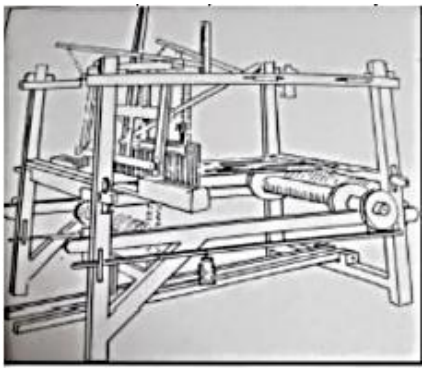


Fig. 2: Maintenance Weaving Handloom
(Source: Enie, Herlison and Koestini Karmayu, 1980; Frans Aditia Wiguna, & Erwin Putera Permana, 2019)

Until 2013, Troso ikat weaving mostly used hand looms, semi-mechanized looms, and mechanical looms, both of which speed up production (Alamsah, 2014; Rahmadani & Subandi, 2015). Initially relying on cotton, the industry expanded its materials to include rayon, polyester, and silk in the 1990s to meet growing demand. Weavers also use chemical dyes to enhance color: napthol, a powder that requires caustic soda and diazonium salts; Indigosol, a dye that offers bright, stable color; and Remazol, a reactive dye known to be resistant to sunlight and has a wide color range (Puspita Kharisma et al., 2021).

5.5 Support from the Government

Government support has boosted Troso ikat weaving significantly. In 1980, the Governor of Central Java promoted its use for government uniforms (Khasanah et al., 2022). A 1988 mandate required civil servants to wear woven clothing on Fridays, and similar policies continued in the 2000s (Alamsah, 2014). In 2005, batik mandates increased Troso production by 100%. In 2010, the Governor recommended the use of Troso woven uniforms on Wednesdays.

5.6 Field Techniques

Troso Village weavers have adapted their techniques to meet consumer demands. Initially using only traditional weft and warp methods, they later introduced various techniques such as Dondom (1990s), Jumputan (2008), and embroidered combinations (2010). Dondom involves hand-adding decorative threads, Jumputan uses tie-dye methods with rope barriers, and embroidery adds thread-based designs (Hendro G, 2000; Gracia Veronica, 2018). Geometric motifs, such as Rangrang from East Seraya, also became popular, inspired by the local geography.

5.7 Flexible Work Systems

Initially, Troso weaving workers commuted from outside the village, incurring high transportation costs. The situation improved when local weavers started borrowing tools from businesses, reducing transportation costs and increasing their wages (Interview with Mr. Hamdi). Some workers follow a wholesale model, taking work home and submitting it weekly. Others perform specific tasks like threading or coloring, with production often done at home.The flexibility and variety of work models contribute to the sustainability of the ikat weaving industry in Troso.

6.0 Conclusion and Recommendations

The ikat weaving tradition in Troso has persisted due to its initial role in meeting local clothing needs and its subsequent evolution into an economic activity. As demand grew, Troso's weaving adapted materials and techniques, supported by government policies that enhanced production and market reach. The craft thrives because the community actively develops and markets it, preserving local wisdom while adapting to market demands. Despite this, traditional knowledge risks being lost due to insufficient conservation efforts (Borshalina, 2015; Halim et al., 2013; Khusniati et al., 2023).

Acknowledgements

We would like to thank the Directorate of Research, Technology and Community Service, Directorate General of Higher Education, Research and Technology, Ministry of Education, Culture, Research and Republic of Indonesia Technology for funding in Empowerment of Regional Business Partners Entrepreneurship Based Superior Products Empowerment scheme in 2024 with contract number 128/E5/PG.02.00/PM.BARU/2024; 027/LL6/PgB/AL.04/2024; 21/SP2H/PENDEDITION/LPPM/UNISNU/VI/2024. Our thanks also to LPPM UNISNU Jepara for facilitate this service activity the body which funded your study.

References

Alamsyah , (2014). Dynamics Development Industry Craft Weaving Troso in Jepara . Humanika Vol. 20 No. 2. 24-36.

Azkiyyah , Mallinda . (2019). Historical Visual Book Design and Decorative Motifs Weaving Troso Jepara . Thesis , Yogyakarta Indonesian Art Institute .

Azrool Idzwan bin Ismail, Jati Widagdo , Asmidah Alwi, and Nimas Aulia Pambajeng Mifahunnajah . (2023). The Gedhok Fabric Preservation Through Culture And Economy. Journal of Creative Industry and Sustainable Culture. 81-95.

Bapeda Jepara - LPEB STIENU Jepara . (2006). Identification and Development of Production Area Centers in the Regency Jepara Year 2006: Draft Interim Report . Jepara .

Chariri , A. (2009). " Base philosophy and method study qualitative ", Paper presented at the Methodology Workshop Study Quantitative and Qualitative , Laboratory Development Accounting (LPA), Faculty Economics , Diponegoro University , Semarang.

Denzin, N.K., & Lincoln, Y.S. (Eds.). (1994). Handbook of qualitative research. Sage Publications, Inc.

Hamdan Bahalwan . (2021). Re-Design Of Troso Weaving As Representation Of Jepara City. International Conference on Arts and Culture. 231-238.

Hendro G, EkoPunto . (2000). When weaving change village Troso.Semarang : Flag .

Intikaroh , N. (2018). Collaborative Governance in Management Umkm Weaving Troso in the Regency Jepara . 1–10.

Ismanto , H., Tamrin , MH, Pebruary , S. (2018). Small and Medium Business Assistance Weaving Ikat Troso in. Journal Community Service and Empowerment , Vol, 2. Number 1.

Ivana, Felicia. (2015). Ikat Weaving Website Design from Troso Village Jepara, Central Java. DKV Adiwarna Journal . Vol, 1 . No.6.

Jati Widagdo , Adzrool Idzwan Ismail and Asmidah alwi . (2022). Batik Marketing Strategy in the Covid-19 Pandemic era. ICSST.
Jati Widagdo , Adzrool Idzwan Ismail and Asmidah alwi . (2023). The Gedhok Fabric Preservation Throught Colture and Econoy . Journal of Creative Industry and Sustainable Culture. Vol,2. 81-95.

Joko Triyono. (2020). Tourism Village Development Strategy Troso Ikat Weaving in Jepara , Central Java. Journal Tourism . Vol, 14. No, 2. 84 – 92.

Misbahul Awang Sakti & Kholis Roisah . (2020). Characteristics and Problems of Lubeng Motif Protection Weaving Troso . Journal of Jurisprudence. Vol, 9. No, 2. 203-221.

Muhammad Fadhil Indra. (2023). Analysis Design Woven Fabric Promotion Troso As Inheritance Culture Jepara (Case Study: Sentra Lestari Indah Putera). Tradition: Journal of Design and Culture Literature . Vol, 2. No, 1. 19-23.

Muhammad Rijal Fadli. (2021). Understand design method study qualitative, Jornal Humanika , Scientific Studies in General Subjects , Vol, 21. No, 1.

Muslichah Erna Widiana , Nova Retnowati , Agus Slamet. (2022). Empowerment Group Gedhok Batik Craftsmen in Kerek Tuban New Normal Period. Journal Unpemas . Vol, 2. No, 1. 32-39.

Novia Nur Anisah and Muh Fakhrihun Na'am. (2021). Existence Weaving Troso Jepara Among the Founding of Garment Companies . Journal Fashion and Food Technology . Vol. 9 No.2. 148-154.

Putri, FF, Widjanarko, D., & Syamwil, R. (2018). A Model of Local Potential Based Fashion Production Units for Troso Woven Fabrics. Journal of Vocational and Career Education, 3(2), 88–95.

Rosdiana , A., Yulistianti , HD, & Nafisah, Z. (2018). Strengthening Local Wisdom through Troso Design by Applying Embroidery among Weaving Craftsmen. International Conference on Community Programs . 20–28.

Sarwono , Nadia Sigi Prameswari , Darwoto Darwoto , Zunaila Akhmad, Hanisa Hassan. (2023). The Experiment of Jepara Troso Woven in Local Wisdom. Harmonia: Journal of Arts Research and Education. Vol. 23.No. 1. 28-39.

Walidin, W., Saifullah, & Tabrani. (2015). Methodology study qualitative & grounded theory. FTK Ar-Raniry Press.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

"Glass Waste" in the Perspective of Religious Awareness and Artistic Creativity

Arif Suharson*, **Dyah Retno Fitiani**

Craft Department,
Institut Seni Indonesia Yogyakarta, Yogyakarta, Indonesia

arifsuharson318@gmail.com, dyahretno13@isi.ac.id
Tel: +62 813-9205-2852

Abstract
This article explores the environmental impact of glass waste and offers creative solutions through art and religious awareness. Glass is crucial in various human activities despite its fragility and slow decomposition. The study investigates innovative ways to reuse glass waste in artistic and religious contexts, focussing on its application in ceramics and decorative arts. By presenting case studies, the article proposes that glass waste can be creatively repurposed, addressing environmental concerns while enhancing religious and artistic value. This approach provides a new perspective on integrating glass waste into art for environmental and spiritual benefits.

Keywords: Waste glass; natural environment; magical-religious; artistic creation

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6145

1.0 Introduction

The history of glass dates back to approximately 3500 BC, originating in Egypt and Eastern Mesopotamia. The technology to produce transparent glass had yet to be developed during this early period. Instead, glass created opaque luxury items, particularly beads, which held significant cultural and symbolic value. Beads were considered unique, rare, and magical, often evoking associations with exotic nature. This allure made them desirable as status symbols, representing wealth and power. The multifaceted significance of beads extends across disciplines like cosmology, anthropology, history, and archaeology, reflecting their role as artistic objects and cultural artifacts (Nasruddin, 2017).

Beads also played a role in religious and spiritual practices. They were often buried with the deceased as provisions for the afterlife, symbolizing a high social status and believed to facilitate the journey to a better existence. This dual function—a symbol of wealth and a religious object—further highlights their cultural importance (Oktaviana, 2005).

Regarding practical applications, glass technology advanced significantly in Central Mesopotamia, where artisans began crafting functional items such as bowls, plates, and vases. These innovations were spread by Venetian merchants along the Mediterranean Sea, leading to the diversification of glass products, which became thinner and more intricate. The craft then expanded to regions like

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6145

Greece, China, and Western Austria, where new techniques, such as dipping molds into molten glass, allowed for more elaborate designs (Christina E., 2019).

However, alongside this rich history, the modern issue of glass waste has emerged as a significant environmental concern. While highly durable, glass is not biodegradable and can persist in landfills for centuries. The same material that once symbolized wealth and status now contributes to growing waste management challenges. Inadequate systems for separating and recycling glass exacerbate this problem, with much of it ending up in landfills, where it poses risks to workers and ecosystems. Addressing this issue requires a renewed focus on recycling and reusing glass, transforming what was once a luxury material into a sustainable resource for the future. The evolution of glass from a revered object to a waste problem underscores the need for responsible production and consumption practices in modern society.

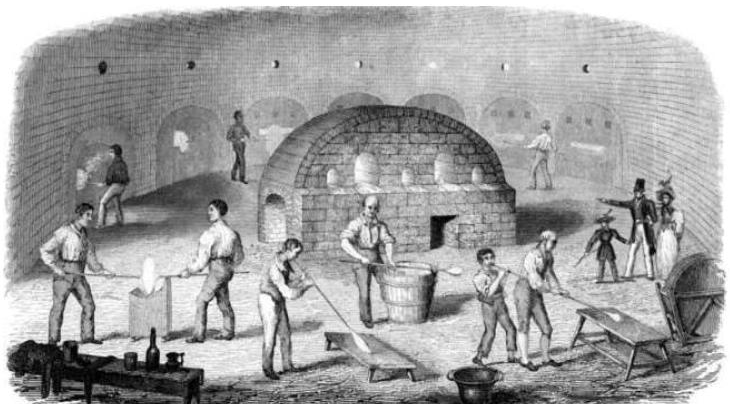


Fig 1. Illustration of the glass industry in the early centuries, all stages are still done manually
(Source: https: www.bioglass.org/news/)

2.0 Literature Review

Glass and its applications have significantly evolved since its invention, with various types of glass being developed to meet specific functional needs. Flat glass, commonly used in construction, curved glass for vehicles, and round glass for food and beverage containers are just a few examples of how glass has become integral to modern life. It is also widely used in industries such as fiberglass production and optics. Despite the widespread use and benefits of glass, it has inherent drawbacks: it is fragile and non-biodegradable. Glass waste, unlike organic materials, takes an estimated one million years to decompose, making it a pressing environmental concern (Silva et al., 2020).

The increasing consumption of glass, driven by its aesthetic appeal and versatility, has led to a surge in glass waste. In 2018, the United States generated over 12 million tonnes of glass waste, with a recycling rate of only about 25%. European countries, such as Germany and Italy, have achieved higher recycling rates, exceeding 60%, but even in these regions, significant amounts of glass end up in landfills (Mutha et al., 2021). While generating less glass waste than these larger economies, Indonesia still needs to work on managing this non-biodegradable material, with minimal infrastructure for proper recycling practices (Supriyanto & Wibisono, 2022).

The global focus on plastic waste often overshadows the environmental impact of glass waste, yet glass poses equally severe risks. Given its long decomposition time and the high consumption of glass products, more attention must be given to recycling and repurposing glass waste. This calls for creative, sustainable solutions integrating glass waste into various aspects of human life, including socio-cultural practices and artistic endeavors (Kumar & Singh, 2019).

Despite growing awareness, more research on innovative ways to handle glass waste is still needed, particularly in ceramics and art. Recent studies have increasingly explored the intersection of glass waste and sustainability in art, but challenges remain in scaling these initiatives. Much of the existing research, while providing valuable insights, needs comprehensive long-term solutions for reducing the environmental impact of glass waste. Practical applications of glass waste in art and ceramics are still in their infancy. Many efforts are confined to small, localized projects rather than integrated into broader environmental strategies (Zhang & Li, 2020). This study addresses these gaps by focusing on the creative reuse of glass waste within ceramics and art. By applying Owen Jones' aesthetic theory—which suggests that aesthetics arise from the harmonious relationship between humans and their environment (Jones, 2004)—the research explores how artistic creativity can provide new perspectives on waste management.

Furthermore, recent studies, such as those by Mutha et al. (2021) and Silva et al. (2020), have underscored the importance of sustainability in modern art practices, with glass waste offering significant potential for artistic and environmental advancements. Using a qualitative approach, this study adopts a descriptive case study method, which allows for an in-depth examination of contemporary, real-life phenomena (Yin, 2018). Through this approach, the research provides both theoretical and practical insights into how glass waste can be minimized and its economic value extended within society. The findings will be presented through descriptive data, drawing on written and oral explanations from subjects involved in the creative reuse of glass waste. In summary, while significant strides have been made in understanding the environmental impact of glass waste, challenges remain in scaling innovative solutions and integrating

them into broader waste management strategies. By contributing to this field of research, the study aims to provide a deeper understanding of how glass waste can be repurposed artistically, offering sustainable solutions for both the environment and the creative industry.

3.0 Methodology

This study employed a qualitative research approach using a descriptive case study method. The primary data were collected through observations, interviews with artists, and analysis of glass waste utilization in creative and religious contexts. The selected case studies include glass waste applications in ceramic art, architectural ornamentation, and flameworking techniques used by local artists. Literature reviews further supported data to deepen the understanding of glass waste's environmental and cultural impact. The selection of specific artists and religious practices was purposeful, based on their prominent use of glass waste in their artistic and spiritual expressions. Artists who integrated glass waste into their works were chosen because they represent innovative practices in waste repurposing, particularly in the context of sustainability in the creative industry. The study focused on glass waste repurposed in creative industries, particularly ceramic art and religious-based artistic works. Local religious practices that use glass, such as creating decorative elements for places of worship or sacred objects, were also considered due to their cultural and symbolic significance in Yogyakarta.

Yogyakarta was selected as the primary observation site because of its strong artistic community and cultural relevance. The city is home to many artists and artisans known for experimenting with unconventional materials, including glass waste. This allowed for an in-depth exploration of how artists approach the environmental issue of glass waste while creating aesthetically, culturally, and spiritually significant works. The data analysis was conducted in two main phases: thematic and comparative. Thematic Analysis: The observations and interviews were transcribed and analyzed using a thematic approach to identify recurring patterns and themes related to glass waste repurposing. Key themes included the environmental awareness of artists, the religious symbolism attached to glass in religious practices, and the aesthetic considerations when using glass waste in art. The thematic analysis helped reveal how glass waste is perceived as an artistic medium and a material with religious or spiritual significance. Comparative Analysis: This phase involved comparing the practices of different artists and religious groups in their use of glass waste. For example, the methods used by ceramic artists to integrate glass waste into their work were compared to the use of glass in religious ornamentation. The comparative analysis highlighted the creative differences and similarities in how glass waste is treated in secular and religious contexts, thus enriching the study's understanding of the broader implications of glass waste repurposing.

Artists were selected based on their significant contributions to glass waste repurposing, particularly those utilizing ceramic and flameworking techniques. Flameworking was particularly interesting due to its ability to transform glass waste into new artistic forms that are both functional and decorative. Artists involved in ceramic art were chosen because they frequently experiment with mixed media, making them ideal candidates for studying the intersection of glass and ceramic materials. These artists' works address environmental sustainability and explore the aesthetic potential of reusing glass in unexpected ways. Religious practices involving glass were selected because they provided insight into how communities assign sacred value to repurposed materials. In particular, glass ornamentation in religious contexts was analyzed for its symbolic meaning, often representing purity, light, and transcendence. This choice allowed the study to examine how waste materials, commonly viewed as undesirable, could be recontextualized into objects of beauty and spiritual significance; by combining these different perspectives—artistic, cultural, and religious—the study aimed to provide a holistic view of glass waste repurposing, highlighting both its environmental benefits and its capacity to enrich creative and religious expressions. The framework was guided by Owen Jones' aesthetic theory, which emphasizes the relationship between humans and their environment through artistic expression, making it a fitting lens for analyzing these diverse applications of glass waste.

4.0 Findings

The findings of this study reveal the potential of glass waste as an alternative material in art and design, particularly in ceramics and decorative arts. In Yogyakarta, artisans have successfully incorporated glass waste into pottery, using it as a decorative element and a glaze substitute. The research demonstrated that when finely ground and mixed with other materials, glass waste can be applied to ceramics at firing temperatures of 1050 °C. This results in visually appealing, durable, cost-effective, and environmentally sustainable finishes. Additionally, religious symbolism was found to play a significant role in the utilization of glass waste in Javanese culture. In traditional Kudus houses, glass shards are used in roof decorations (wuwungan) that convey spiritual messages and cultural values. These decorations reflect the Javanese philosophy of "manunggaling kawula lan Gusti" (unity of the individual with God), adding a layer of religious awareness to the creative reuse of glass waste. Finally, the study highlighted innovative practices in flameworking, particularly in the work of Ivan Bestari Minar Pradipta, who transforms glass waste into high-value artistic pieces. His use of flameworking techniques allows for the creation of jewelry and abstract art, showcasing the versatility of glass waste as an artistic medium. These findings suggest that glass waste can be creatively reused with increased awareness and support, providing economic and environmental benefits.

5.0 Discussion

Glass has been vital in human culture, serving in magical-religious practices, jewelry, functional objects, and art. However, its production significantly impacts the environment. Glass is made from silica sand, soda ash, and limestone, materials often mined in ways that harm ecosystems. The manufacturing process requires high temperatures (around 1700 °C), consuming large amounts of energy, often from

fossil fuels, leading to greenhouse gas emissions and pollution. Additionally, poor glass waste management can cause injuries and long-lasting environmental harm. Although recyclable, glass recycling rates remain low, highlighting the need for increased awareness and sustainable production practices.

5.1 Glass Material and its Impact on Human Life

Unlike solid materials like iron or wood, glass is often seen as translucent and fragile. However, modern glass can be nearly as strong. Since the 1990s, glass has been famous in architecture due to its transparency, giving a sense of openness (Garg, 2007) while providing a modern aesthetic (Lestari, 2014). Glass varies in type due to differences in composition and manufacturing. However, silica sand is the primary material. Glass is chemically a supercooled liquid, with particles spaced far apart like in liquids, forming this structure when cooled quickly (Agus Cahyana, 2014). Though glass has many benefits, improper disposal can cause severe injuries and contribute to environmental pollution. It is non-biodegradable and increases carbon emissions during production, contributing to climate change (Pratama, 2019). Greenhouse gases like CO2 and CH4 are vital contributors to climate change (Mona et al., 2024). Managing glass waste requires responsible use, better recycling, and government policies. In places like Bantul, Yogyakarta, improper handling of glass waste has injured workers, with little done to address the growing waste issue.

Fig 2. Broken glass waste in Bantul Waste Management Landfill that has not been tidied up yet
(Source: Author's Documentation, 2024)

5.2 Glass Waste in Religiosity and Art Creativity

Ceramic artists have utilized glass waste as a decorative element in pottery, offering a creative solution to the abundance of glass waste, especially in Yogyakarta. Despite its small size, Yogyakarta faces significant waste management challenges, particularly after the closure of the Piyungan landfill in July 2023, which led to uncontrolled waste accumulation. Public awareness of waste management needs to be higher, even though regulations like Law No. 18/2008 encourage the 3R (Reduce, Reuse, Recycle) approach. However, waste sorting still needs to be improved, with mixed organic and inorganic waste, including glass (Ardhi, 2023). Culturally, glass waste holds significance in Javanese society, reflected in the phrase "ngenteni beling bosok" (waiting for rotten Glass), symbolizing the futility of waiting for the impossible. This philosophy is also seen in using glass shards in traditional Javanese decorative art, particularly in the wuwungan of houses in the Kudus region. These glass shards are arranged to create luminous, aesthetic designs with symbolic meanings, passing cultural messages through art (Suharson, 2022; Haryono, 2009). This tradition emphasizes that art and practicality can coexist in addressing waste, offering valuable lessons for modern waste management practices.

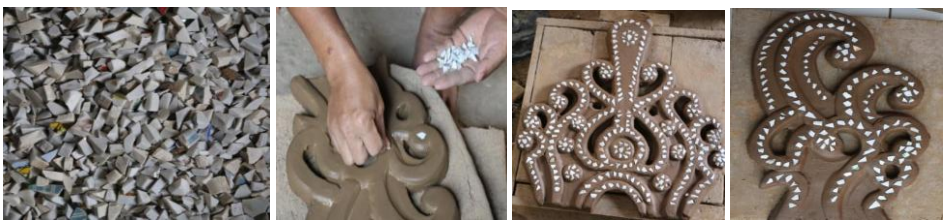


Fig 3. Traditional Kudus house with *wuwungan* decorative art creations using shards of shard/glass
(Source: Author's Documentation 2022)

The *wuwungan* decorative art in traditional Kudus houses serves practical and symbolic purposes. It protects the roof while conveying cultural and moral messages rooted in Javanese philosophy. In *joglo pencu* Kudus houses, three main patterns are placed on the roof, blending aesthetic design with cultural significance.

1. *Gunungan* patterns have a shape similar to the *gunungan* in shadow puppet art.
2. Vine, *lung*, or *ukel* patterns.
3. Cungkrik, gelung cekak, or rooster cockerel patterns.

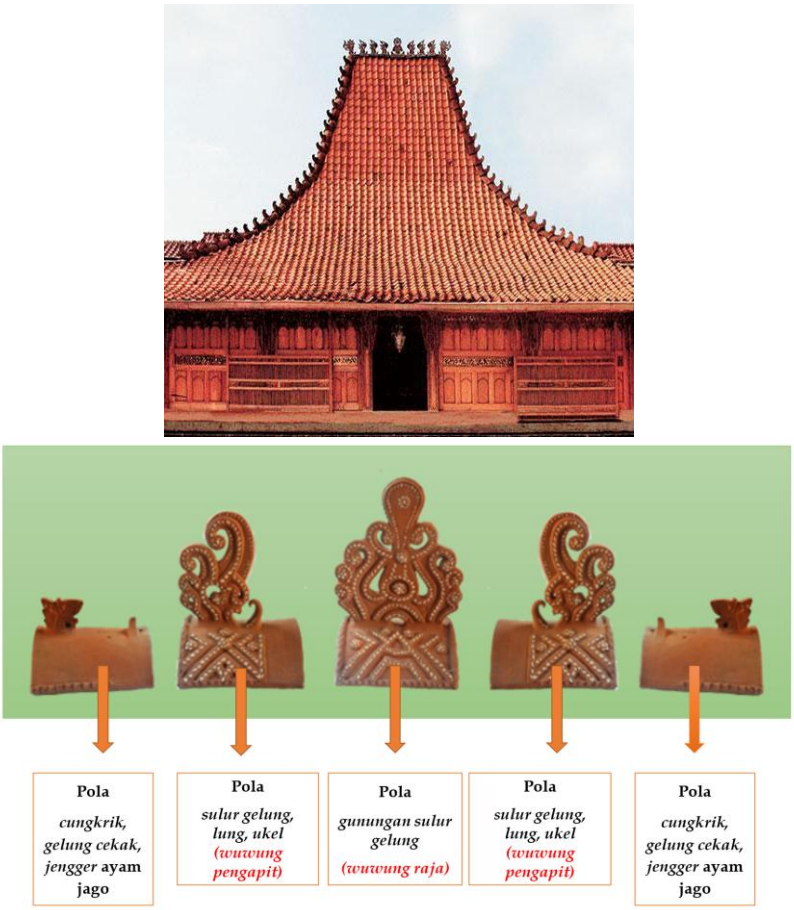


Fig 4. Traditional Kudus house with *wuwungan* decorative art creations using shards of shard/glass
(Source: Author's Documentation 2022)

The ornamental patterns in *wuwungan* art of traditional Kudus houses are rooted in the *gusjigang* philosophy (good, religious study, and trading) and avoid realistic depictions of living beings adhering to Islamic teachings. Owen Jones emphasizes that aesthetics in ornamental art stems from geometric constructions reflecting human-nature relationships (Jones, 2004). Kudus artisans incorporate nature and cultural acculturation into detailed and symbolic *wuwungan* designs, reflecting Javanese cosmology and the belief in divine light. The white porcelain shards at the roof's peak symbolize the connection between humanity and the divine (Pitana, 2014). Glass waste has also been creatively used in pottery. Transparent glass shards are applied decoratively to pottery pieces, adhering with glue and cement to cover imperfections. This approach emerged from broken pottery in Kasongan, and using glass fragments enhances the aesthetic appeal while reinforcing the structure. Andreola et al. (2016) highlight that glass waste can be successfully integrated into ceramics, producing durable products comparable to traditional tiles.

Fig 5. Glass waste is recreated in pottery products in Kasongan Village as plates, flower vases, and wall hangings.
(Source: Author's Documentation 2024)

Glass's flexibility should be leveraged for sustainable innovations that benefit the environment and future generations. One such innovation is using glass waste as an alternative glaze material for ceramics. This approach aims to educate artisans and the public on reusing glass waste instead of costly glazes like TSG. Glaze, primarily composed of glass-forming silica (SiO_2), can be replaced by waste glass materials. Fluorescent lamp glass waste, with its suitable thickness and softness, has proven particularly easy to process into the glaze. It can be crushed, screened, and mixed with colorants, making it ideal for ceramic surfaces. With a melting point of 600–

800 °C, glass waste adheres well to pottery, enhancing its character and color. Colored glass shards—blue, green, brown—maintain their hues after firing, offering versatile decorative potential.

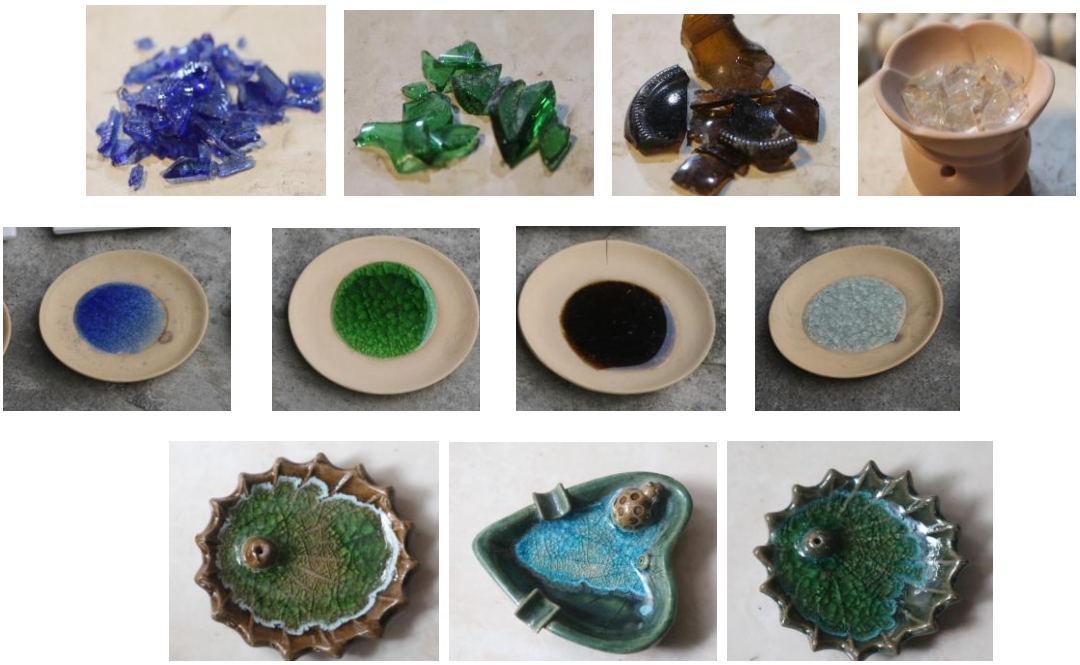


Fig 6. The result of the effect of broken glass waste sprinkled directly on the pottery/ceramic body with a convex side as an alternative finishing.
(Source: Author's Documentation 2019)

Our experimental research explores ways to use glass waste as a direct alternative for finishing pottery. We are working to find the best method for glass waste to adhere to pottery bodies with perpendicular sides, aiming for an aesthetic and value-enhancing solution. Ideally, this can be achieved without purchasing additional materials, using waste, or accessible resources. One technique involves crushing glass waste into a fine powder, mixing it with clay and water, and applying it to pottery bodies using a brush. Fired at 1050°C, the glass waste adheres reasonably well, although results are still being refined. This approach extends the life of glass waste and offers a creative solution to environmental concerns while enhancing the visual appeal of ceramics.

Fig 7. The result of the effect of powdered glass waste shards combined with soil and applied to ceramic products.
(Source: Author's Documentation 2019)

Fig. 8. Ivan's creative process in creating innovative works with glass waste
(Source: Pradito Reda Pertana, 2022)

Yogyakarta, renowned for its creativity and education, showcases artists like Ivan Bestari Minar Pradipta, who transforms glass waste into high-value art using the flameworking technique. This method involves melting glass with a furnace, stove, or torch at 1000–1200 °C (Nukke Sylvia, 2018). Ivan's gallery, Otakatik Creative Work, features unique glass creations, including jewelry and abstract pieces. He sources glass waste from other artisans, melts it with an LPG gas cylinder and oxygen, and shapes it into intricate designs, demonstrating his skill in producing decorative and functional art.

Fig. 9. Ivan's work with the flameworking technique
(Source: MLDSPOT, 2020)

Ivan Bestari Minar Pradipta's passion for glass art began during an internship at a glass blower in Yogyakarta, leading him to explore this rare art form in Indonesia. He transforms glass waste—such as mirrors, bottles, and stained glass—into unique handicrafts and jewelry. He uses two main techniques: hot working, involving fire, and cold working, which includes carving and grinding. Ivan's work exemplifies how glass waste can be repurposed to reduce environmental pollution. Both policymakers and individuals must actively prevent glass waste and recognize its potential. We can create high-value art and functional products by innovating and reimagining waste materials. This approach not only addresses waste management but also contributes to environmental sustainability.

6.0 Conclusion and Recommendations

This article presents an innovative solution to mitigate the environmental impact of glass waste through aesthetic and artistic methods. Case studies reveal that glass waste can be transformed into artistic creations, reducing ecological burdens and adding value from both creative and spiritual perspectives. This approach highlights the role of spiritual awareness and artistic creativity in developing sustainable solutions. The findings encourage further research and innovation in glass waste utilization, supporting broader environmental conservation efforts.

Acknowledgments

This research, generously funded by the Faculty of Visual Art at ISI Yogyakarta, focuses on Yogyakarta due to its vibrant cultural and artistic landscape, making it an ideal setting to explore the environmental and creative solutions to glass waste through art and religious practices. Yogyakarta, known for its integration of traditional and contemporary art forms, offers a unique environment where local artists and religious communities have repurposed glass waste in both symbolic and practical ways. A few case studies were selected to allow for a focused and in-depth analysis of these practices, enabling the research to delve deeply into the techniques, challenges, and cultural meanings associated with glass waste reuse. The study highlights broader trends in sustainable art practices and religious symbolism by concentrating on critical examples while offering insights that can inspire similar efforts in other regions. The selected case studies illustrate how glass waste can be transformed into culturally significant and environmentally responsible works, contributing to the growing discourse on sustainability in the creative and religious sectors.

Paper Contribution to Related Field of Study

This paper contributes to the study of integrating glass waste into art for environmental and spiritual benefits.

Reference

Agus Cahyana, A. M. (2014). Kinematika Kristaliasi Pada Kaca. *Prosiding Seminar Nasional Fisika dan Pendidikan Fisika (SNFPF) Ke-5 2014V olume 5 Nomor 1 2014 ISSN : 2302-7827*, (pp. 25-29).
Ardhi, S. (2023). *Jogja Darurat Sampah, Ahli UGM: Kenapa Baru Gaduh Sekarang?* Yogyakarta: ugm.ac.id.

Astuti, A. (1997). *Pengetahaun Keramik.* Yogyakarta: Gadjah University Press.

Christina E., M. (2019). *Kaca Untuk Bangunan.* Yogyakarta: Andi Publisher.

Fernanda Andreola, Luisa Barbieri, Isabella Lancellotti, Cristina Leonelli, Tiziano Manfredini, Recycling of industrial wastes in ceramic manufacturing: State of art and glass case studies, Ceramics International, Volume 42, Issue 12, 2016, https://doi.org/10.1016/j.ceramint.2016.05.205

Garg, N. (2007). *Guidelines for Use of Glass in Building.* New Delhi: New age international publisher.

Haryono, T. (2009). *Seni Dalam Dimensi Bentuk, Ruang, dan Waktu*. Jakarta: Wedatama Widya Sastra.

Kumar, A., & Singh, S. (2019). Glass Waste and Its Recycling: A Review of Emerging Solutions for Sustainable Waste Management. *Journal of Cleaner Production*, 236, 117661. https://doi.org/10.1016/j.jclepro.2019.117661

Lestari, M. R. (2014). Penerapan Material Kaca Dalam Arsitektur. *Langkau Betang Jurnal Arsitektur Vol 1, No 2 DOI: http://dx.doi.org/10.26418/lantang.v1i2.18798*, 1-13.

Mutha, N., Patel, M., & Singh, A. (2021). Waste Glass: Recycling and Reuse Opportunities. *Waste Management Research*, 39(5), 783-795. https://doi.org/10.1177/0734242X21101234

Mona Febriani Irma, E. G. (2024). HIGH-TEMPERATURE RISE DUE TO INCREASED GREENHOUSE GAS EMISSIONS IN INDONESIA. *JSSIT: Jurnal Sains dan Sains Terapan Volume II, Nomor 1,Februari 2024*, 26-32.

Mora Mutiah Ulfah. (2024). Pengaruh Penambahan Silika (SiO2) dan Suhu Pembakaran Terhadap Karakteristik Keramik Kordierit Berbasis Abu Sekam Padi. *Jurnal Fisika Unand (JFU) Vol. 13, No. 1, Januari 2024, hal.54 – 60 https://doi.org/10.25077/jfu.13.1.54-60.2024*, 54-60.

Nasruddin. (2017). *Eksotisme Manik-Manik Menembus Zaman*. Pusat Penelitian Arkeologi Nasional: Jakarta.

Nukke Sylvia, N. L. (2018). Tinjauan Proses dan Teknik Flameworking Pada Limbah Kaca. *Narada Jurnal Desain & Seni FDSK-UMB Vol 5 Edisi 2*, 27-36.

Oktaviana, A. A. (2005). Manik-Manik Nusantara. *Romantika Arkeologia, No. 81 tahun XXVII*, 10-16.

Pitana, T. S. (2014). *Dekonstruksi Makna Simbolik Arsitektur Keraton Surakarta*. Purwokerto: STAIN Press.

Pratama, R. (2019). Efek Rumah Kaca Terhadap Bumi. *Buletin Utama Teknik Vol. 14, No. 2, Januari 2019*, 120-126.

Silva, R. V., de Brito, J., & Dhir, R. K. (2020). The Role of Glass Waste in the Circular Economy: Recycling and Environmental Benefits. *Journal of Cleaner Production*, 245, 118853. https://doi.org/10.1016/j.jclepro.2019.118853

Suharson, A. (2022). *Estetika Seni Hias Wuwungan Rumah Tradisonal Joglo Pencu Kudus.* Surakarta: Disertasi Program Doktor Pascasarjana Institut Seni Indonesia Surakarta.

Supriyanto, T., & Wibisono, B. (2022). Glass Waste Management in Urban Areas of Indonesia: Challenges and Solutions. *Journal of Environmental Management*, 306, 113440. https://doi.org/10.1016/j.jenvman.2021.113440

Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods*. 6th ed. Sage Publications.

Zhang, Y., & Li, W. (2020). The Potential of Glass Waste in Artistic Creativity: An Overview. *Sustainability*, 12(12), 5005. https://doi.org/10.3390/su12125005

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Analysis of the Chemical Composition, Properties, Aesthetics, and Craft of Zisha Clay: A potential environmentally friendly material for jewelry design

Xiaoli Sun, Siti Suhaily, S.*, Huasheng Lai, Kaifeng Chen
**Corresponding Author*

Product Design Department, School of The Arts,
Universiti Sains Malaysia, Penang, Malaysia

sunxiaolisq1216@163.com, ssuhaily@gmail.com, watsonart@163.com, chenkaifeng@student usm.my
Tel: 601118583206

Abstract
Zisha clay has always been regarded as the preferred material for making teapots, but its potential as a human body decoration has rarely been explored in depth. This article aims to study and analyze the material composition, property, aesthetic, and craft innovation of Zisha clay in jewelry design. Exploring Zisha clay as a new jewelry material broadens its application and provides a new perspective for its sustainable development in the jewelry industry. Zisha clay is more accessible and environmentally friendly than traditional jewelry materials, so this study is of reference value for promoting the creative industry.

Keywords: Zisha clay; jewellery; properties; craft

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6167

1.0 Introduction

This study aims to explore and analyze the potential of Zisha clay as a sustainable and environmentally friendly alternative to traditional jewelry materials. Zisha with its unique tone and material characteristics in the field of ceramics, the ceramic industry is traditional and has a significant market, and the jewelry industry shows a steady growth trend. According to Statista data, the global jewelry market revenue will reach 310.9 billion in 2024 and maintain a high compound annual growth rate of 3.53%. Driven by a series of China's economic consumption policies, the demand for the jewelry market further expands, and jewelry will become the fastest-growing category in all commodity retail categories in 2023 (National Bureau of Statistics of China, 2024). This growth is mainly due to the improvement in consumer purchases and the trend of aesthetic demand for jewelry, become an indispensable part of people's daily lives. However, jade, diamonds, and other resources are rare, and the price has risen seriously; the reserve of precious jewelry materials is decreasing (WPIC, 2023). The mining of precious jewelry materials requires much energy and labor and will cause serious damage to the environment, and research on alternative materials is carried out to achieve resource conservation and environmental protection. Jewelry design is in constant pursuit of innovation, and contemporary jewelry is no longer limited to the application of materials, which has inspired artists to design ceramic jewelry.

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6167

Although many creative designs of ceramic jewelry are available on the ceramic market, few are made from Zisha clay. Zisha clay is a unique type of pottery clay, and the primary type of clay is a dark purple hue. Zisha pottery has existed since the Song Dynasty in the 10th century AD, as evidenced by fragments of Zisha pottery excavated in Yixing, China, in 1976 (Wang Yiping, 2013). Zisha pottery was developed during the Ming Dynasty (1368-1644 A.D.) and continues to today, with the most common type of Zisha pottery being the Zisha teapot (Zhu et al., 2019). Since the discovery of Zisha clay has become the most suitable material for tea set in China, it is a practical vessel as well as artwork that can be appreciated, and its production craft has been listed as a national intangible cultural heritage, with humanistic and artistic values (Juan Wu et al., 2013). Currently, practitioners of Zisha pottery also focus on Zisha tea sets, with little attention paid to developing other types of Zisha products, which is not conducive to fully exploring and innovating the cultural heritage of mankind. Understanding the cultural background of Zisha and the industry's current state, seizing the opportunity of Zisha's development, and exploring the application of Zisha clay in jewelry design is of great significance to the development of the environment, culture, and art.

The objectives of this article is to discover and tap the application potential of Zisha clay and inject fresh and innovative thinking into traditional ceramic and jewelry forms. This research will verify the chemical composition, physical properties, and aesthetic characteristics of Zisha clay to explore and analyze its potential as a sustainable and environmentally friendly alternative to traditional jewelry materials.

.

2.0 Literature Review

The design process is a creative activity whose purpose is to determine the quality of various objects and processes throughout the human life cycle. Most designs take into account the diversity of factors such as strength and aesthetic value based on an in-depth study of materials (Siti Suhaily et al., 2019). The research on Zisha's strength and aesthetic value can provide a basis for its application in jewelry design. This article will explore these factors as a potential material for jewelry design. In the traditional craft of Zisha clay tea ware, the clay material, tools, and production process follow the experience and procedure (Yu Xianping, 2022). With its standard, accurate, and elegant plastic art, Zisha pottery shows a unique aesthetic feeling of plastic craft. In jewelry design, the shape of jewelry originates from the reasonable and ingenious combination of point, line, surface, geometry, natural form, and space, creating a variety of shapes (Li Fang, 2020). The symmetry and coordination in jewelry design, the lines, colors, texture, and the virtual space can all constitute different visual effects. Comprehensive materials are one of the popular elements in contemporary society, contemporary jewelry is not restricted by the craft and attaches expression of emotion and material aesthetics. The application of ceramic materials in jewelry design has a unique aesthetic experience (Zou Xiaowen, 2023). Different from other ceramic materials, Zisha can be made into pottery alone without glaze, which can achieve the ultimate in shape and decoration (Jiang Yongjun, et al., 2023). There are many possibilities for the development of Zisha technology, and cross-border cooperation can inject new vitality into jewelry creation (Jiang Feifei, 2024). The combination of Zisha clay and metal, silk, and other materials in jewelry design, using the characteristics of different materials to complement the way of creation, can broaden the performance and diversity of jewelry.

Based on studying the aesthetic of jewelry design, factors such as environmental protection and the safety of materials can be considered to improve people's acceptance. The importance of ecological awareness and the concept of sustainable development has been widely recognized in various industries. Product design needs to fully consider the impact on resources and the environment, reduce pollution, and achieve a harmonious coexistence between humans and nature (Cao Tianhui, 2017). Therefore, for jewelry design, we must first make good choices of materials, naturally pollution-free, reused, recycled, and simple design. Zisha clay is a naturally occurring clay formed over thousands of years by natural weathering and oxidation processes. Today, new technologies help to improve the efficiency of resource utilization and reduce waste, and through reasonable exploitation and utilization, can ensure a sustainable supply of purple sand without excessive depletion of natural resources (He Jiayi, 2022). The adhesion of Zisha clay is very strong, so it is not easy to crack during the production process, and the mud is not sticky hands will not be dusty, so it maintains the cleanliness of the pottery environment. The waste soil produced in the production of Zisha clay and the broken pottery pieces after firing can be recycled. Zisha clay has the advantages of stable composition and no complicated pretreatment (Hao Yaorui, 2022), any shrinkage and deformation rate, and will not change due to the production or firing process (Jian Zhu et al., 2019). Zisha clay only needs to be fired through high temperatures, without adding and generating chemical substances, and no industrial wastewater, waste gas, or garbage. It avoids the generation of toxic and harmful substances and does not affect the environment. However, a combination of a single Zisha clay or compliant clay with naturally colored mud or metal oxides will not cause harm to human health (Wu Yamin, 2024). These characteristics make Zisha clay a choice advantage for making Zisha jewelry, which reflects the value of environmental protection.

By reviewing the literature on jewelry design and Zisha clay, it was found that there is a lack of connection between the two. This study analyzed the feasibility of Zisha clay as a jewelry material based on its environmental protection, molding, and firing stability. Compared with traditional jewelry materials, analyzing and designing Zisha clay as a new jewelry material provides a new perspective for the sustainable development of Zisha clay in the jewelry industry.

3.0 Methodology

The objective of this article lies in analyzing the material and craft of Zisha clay utilized in jewelry design, and applying diverse methods to analyze the chemical composition, physical properties, aesthetic characteristics, and craft molding of Zisha clay, thereby facilitating the discovery of appropriate approaches for developing Zisha jewelry, which is conducive to expanding jewelry product types.

3.1 Chemical composition test

This study collected four kinds of Zisha clay samples, namely purple clay, red clay, Zhu clay, and green clay. The EDX8000 energy dispersive X-ray fluorescence spectrometer (XRF) of Suzhou Real Spectrum Instrument Co., Ltd. was used to test the chemical composition of different types of Zisha clay(Table 1). Use the data to analyze the advantages of the chemical composition of Zisha clay on the molding of Zisha jewelry.

3.2 property test

Test Zisha pottery, ordinary pottery, and porcelain firing at different temperatures, compared with shrinkage ratio, average porosity, and water absorption. The testing instrument was used to observe and analyze the pore distribution of samples with the SEM 8000 China electron microscope, and the porosity was determined by the water boiling method (Table 2). Test the property of Zisha and analyze whether it has the advantage of being a potential material for jewelry.

3.3 Comparative test with other jewelry materials

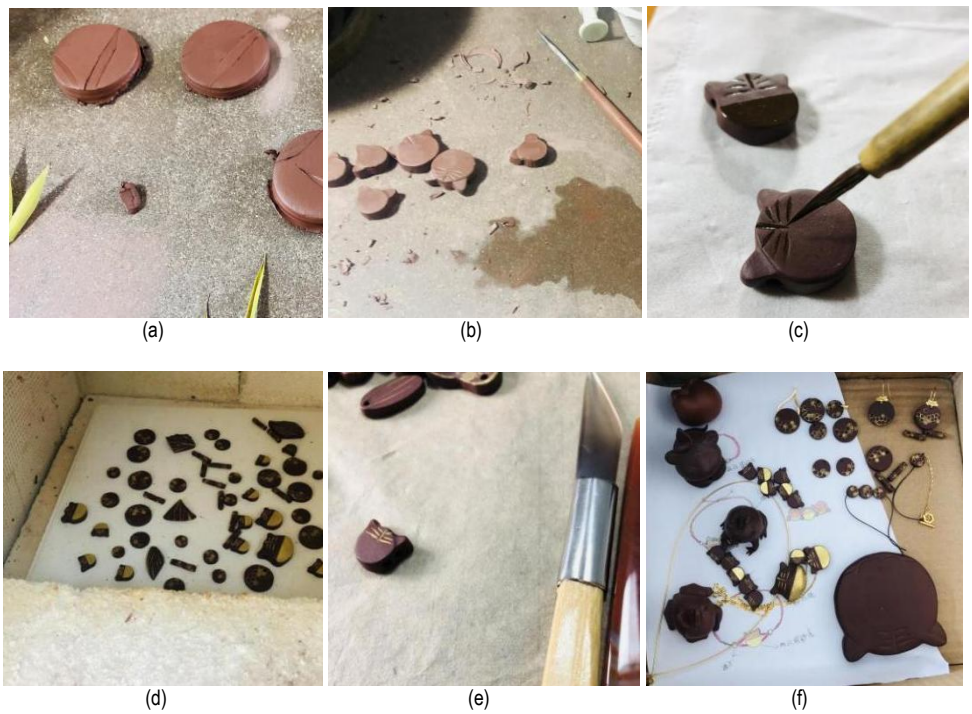
The density, hardness, and strength of the fired alabaster samples were tested against other jewelry materials such as pearl, diamond, gold, silver, jade, and coral, and the density and hardness of these materials were collected. The strength of the different materials was measured by the SGW Strength Tester Flexure Tester produced by China Instrument Co. Ltd. (Table 3) to explore the rationality of using Zisha clay as a potential material for jewelry design.

3.4 Aesthetic characteristics analysis

Through literature, field research, and collection of various colors of Zisha clay after firing pottery (Fig. 2), then analyzed whether the color and texture beauty of Zisha clay is suitable for the jewelry design aesthetic.

3.5 Craft methods

The craft starts with cutting the clay sheet, using the hammering method to extrude the bubbles and pat out the thickness needed for the jewelry, making various shapes according to the design (Fig. 1), and giving the body a smooth or rich texture. Punch holes or reserve a fixed outline for the jewelry blank and combine it with the material for easy wearing after firing. The produced body is dried naturally, and then it is put into the kiln after drying, and the firing temperature is about 1100 degrees. The color of the fired Zisha is monochrome, it can use special gold water to draw, make it shiny and decorative, and then put into the kiln for a second firing, the temperature is about 750~800 degrees, to make the painted gold water never firm and not discolored, and use an agate pen to polish it to become shiny. The last step is to use a comprehensive material, silk or metal assembly, for decorative beauty and to give Zisha jewelry the function of wearing.



(a) (b) (c)

(d) (e) (f)

Fig. 1. (a) Cutting; (b) Shaping; (c) Gilding; (d) Re-firing; (e) polishing; (f) Install.
(Source: Personal Photo Archive, 2024)

4.0 Findings

4.1 Chemical composition

Table 1. Types and chemical composition of Zisha clay(wt%)

Samples	MgO	Sio2	MnO	CaO	TiO2	Na2O	Al2O3	FeO2	K2O
Purple clay	0.57	58.39	0.1	0.25	1.08	0.06	20.12	8.38	3.38
Red clay	0.77	49.96	0.005	0.22	1.05	0.11	16.24	18.96	18.96
Zhu clay	0.54	26.63	0.19	0.16	0.68	0.05	10.40	49.31	1.62
Green clay	0.46	58.32	0.006	0.41	1.07	0.07	24.13	1.91	2.01

(Source: Data from tests, 2024)

Through analysis (Table 1), the content of Sio2 is very high, accounting for about 50%, and is sandwiched in the mud in the form of sandy quartz, part of it becomes the skeleton of the Zisha and is not easy to deform. The other part generates glass material at high temperatures, which fills between the skeletons of the body, increases the density, and helps the Zisha jewelry to be strong. Al2O3 makes it easy to generate mullite crystals, increasing the firing temperature, expanding the sintering range, and giving the Zisha a stable and beautiful physical state. CaO plays a fluxing role; the high content of glass material means that the fired Zisha has a good watercolor effect, making the Zisha jewelry rich in color. Sio2, Al2O3, and FeO2 make the Zisha clay have excellent plasticity and can accurately produce Zisha jewelry with various shapes and textures. Therefore, different chemical components affect production and firing and have different physical properties. Good plasticity, high strength, stability, and beauty provide suitable conditions for jewelry design.

4.2 Material properties

Table 2. Shrinkage, porosity, and absorption of Zisha samples, ordinary pottery, and porcelain

Samples	Firing temperature (℃)	Shrinkage ratio after firing (%)	Average porosity (%)	Water absorption (%)
Purple clay	1150	5~6	10.79	2.7
Red clay	1100	10~13	11.61	2.0
Zhu clay	1040	18~27	9.95	1.6
Ordinary pottery	950	10.5	18.32	11.8
	1000	11.6	17.68	11.1
	1100	12.3	17.27	9.5
Porcelain	1200	5.3	2.61	0.23
	1280	6.5	2.45	0.2
	1300	7.8	2.39	0.16

(Source: Data from tests, 2024)

After analyzing the data (Table 2), we found that among similar types of pottery or porcelain, Zisha samples have a lower shrinkage and average absorption rate than ordinary pottery and have a compact structure with abrasion resistance and strength. Compared with porcelain, the average porosity of Zisha samples reaches about 11%, which allows Zisha pottery to maintain good air permeability. The water absorption rate of Zisha samples is around 2%, which is more hygroscopic than the average 0.2% of porcelain. These advantages can make Zisha jewelry more breathable and comfortable to wear, less prone to odor, and when touching, the skin will become smooth with longer wearing time.

4.3 Comparison with other jewellery materials

Table 3. Comparison of density, hardness, and strength of Zisha samples with other jewelry materials

Types	Density ρ (kg/m³)	Mohs hardness (HM)	Strength (MPa)
Zisha clay	2.5-3.0g/cm³	5.5~6.5	47.8
Pearl	2.60~2.85	2.5~4.5	6.0~7.0
Diamond	3.52	10	450
Gold(Au)	19.32	2.5	110~120
Silver(Ag)	10.49	2.5~3	180
Jade	2.65-2.75	3-7.	100
Coral	2.6~2.7	3~4	1.10~38.56

(Source: Data from tests, 2024)

The test results show that the density of Zisha is similar to that of other jewelry materials such as jade and coral (Table 3). Although its density is lower than that of diamonds, gold, and silver, its hardness is higher than that of other jewelry materials except gemstones, which shows that Zisha has considerable hardness. The hardness of Zisha is related to its unique sandy rock structure. It is hard, moisturized by water and sweat, and becomes smoother and wear-resistant without discoloration when it encounters dust or frequent friction with the skin. This is also the unique feature of Zisha as a jewelry material. The sandy structure gives Zisha a higher strength and can withstand moderate impact, and the smaller the volume of Zisha, the safer it is. Compared with Zisha teapots, Zisha jewelry is less likely to break, which has the characteristics of being a jewelry material.

4.4 Aesthetic characteristics

Currently, according to the appearance and color of Zisha clay, the raw materials of purple clay are classified into purple clay, red clay, and Duan clay. Purple clay is chestnut, brown, and cinnabar purple after firing; red clay is red, scarlet, vermilion, and light red after firing; Duan clay presents different shades of yellow after firing. Zisha clay can also present different color tones of clay depending on the air humidity and firing temperature. In addition, when the creator mixes several clay materials or adds natural oxide colorants, it will produce more colors, such as crabapple red, blue, yellow, dark green, etc. Zisha clay presents a simple and natural color after firing, which is also a good choice for making jewelry with a personalized style. It is also worth mentioning the texture. The main minerals of Zisha clay are quartz, mica hematite, etc., which tend to have more sand and less mud, and good touch is enhanced after firing. Zisha clay has plasticity; with the help of leather and other tools, ground Zisha clay to a smooth texture. Using the tools can create the texture of trees, and adding steel sand and other materials will produce a shimmering texture after firing. The advantage of Zisha clay, which is different from other jewelry materials, is that the texture will become more moist and beautiful after long-term use.

(a) (b)

Fig. 2. (a) Color; (b) Texture.
(Source: From the Internet and the Studio, 2024)

4.5 Crafting results

As shown in the figure (Fig. 3), Zisha has been successfully applied to jewelry design through creation. The production of Zisha jewelry integrates the traditional Zisha craft with the unique techniques of individuals and makes Zisha clay into various jewelry shapes. The design and shape of Zisha jewelry are straightforward, reducing the consumption of natural resources, with a simple way to express the beauty of natural materials.This exploration time of Zisha jewelry is short, and more studies are still needed to verify it.

(a) (b)

Fig. 3. (a) Tiger Zisha jewelry; (b) Plant motif Zisha jewelry.
(Source: Personal Photo Archive, 2024)

5.0 Discussion

Through exploration and analysis, it is found that Zisha has high hardness, wear resistance, and strength, so the fired Zisha jewelry is not easy to damage, can persist in a variety of environments to maintain its beauty, and practicality to avoid long-term wear caused by jewelry fading, oxidation, grinding, and other adverse problems, thereby reducing the frequency of replacement of jewelry, avoid wasting resources. The appropriate porosity and water absorption characteristics make Zisha jewelry comfortable to wear and emit a naturally quaint luster. The plasticity of Zisha clay provides good craft conditions for various shapes and promotes the delicate and diverse appearance of Zisha jewelry, the performance of the texture effect reflects the creator's mastery of materials and craft and the accurate expression of artistic intuition.

In the process of exploration and practice, it is also found that Zisha clay has natural environmental protection characteristics, craft, and cultural inheritance, design of new ideas will enhance the value of jewelry products, reflecting more advantages and inclusiveness, worthy of discussion, so, Zisha jewelry has a large design and creation space. Although the current jewelry materials are very diverse, but precious jewelry materials are relatively rare and expensive, and in contemporary comprehensive material jewelry, some easily obtained materials such as iron, plastic, gypsum, or wood are easies to cause oxidation, discoloration, or pollution and other problems are not widely used in the jewelry industry. In recent years, the pollution of some industries has made human beings pay more attention to the problem of living environment, advocate environmental protection, and reduce the excessive processing and waste of resources. With the growing trend of ecological awareness in product design, the continuous addition of new environmentally friendly materials will provide people with new aesthetic objects. Zisha clay is derived from nature, has pollution-free and sustainable characteristics, and is friendly to people and the environment. The pottery jewelry originally modeled on natural forms in ancient times has returned to the theme of natural ecology. China attaches great importance to the inheritance and development of intangible cultural heritage and craft, which provides new opportunities for the traditional ceramic and jewelry industry. Under the support of culture, art, and technology, the application of Zisha clay in jewelry design has cultural, aesthetic, and environmental value.

In this study, through continuous efforts and attention, Zisha clay as an alternative material for jewelry design, to provide people with new aesthetic objects and get more attention, development, innovation, and promotion. However, compared with traditional jewelry materials, the color of Zisha clay is too dull, and the application and challenge of new jewelry design materials are still in progress. Improving more abundant art forms can enhance the charm of Zisha jewelry and increase its consumer groups.

6.0 Conclusion and Recommendations

The chemical composition, permeability, hygroscopicity, density, hardness, strength, and aesthetics of Zisha clay are analyzed and explored to meet the requirements for making jewelry, reassuring people that Zisha clay's environmental, safety, quality, durability, and aesthetics can be used as an alternative material for jewelry design, and identifying that it can be compared to other types of jewelry materials. The presented methodology of the individual's practice, and the showing final rendering of the Zisha jewelry, whereby the material, primarily used as a pot-making material, is designed and created to be transformed into delicate and minimalist jewelry. The availability of Zisha clay at a reasonable cost will bring new developments in the design and creation of jewelry, and the research objectives were all achieved. This research, the chemical composition, physical properties, and aesthetic characteristics of Zisha clay, this research explores the diversity and beauty of Zisha clay in jewelry design, which can ensure the feasibility of using Zisha clay as an alternative raw material for jewelry, and provide references for Zisha clay potters and jewelry designers. In the future, we will further study the long-term durability of Zisha jewelry, create more artistic forms of Zisha clay in jewelry design, consumer perceptions, and encourage users to adopt a sustainable lifestyle and jewelry design in a variety of innovative ways. At the same time, explore the potential uses of Zisha clay in other industries, promote the development of new uses of Zisha clay, and continue to innovate to open new markets.

Acknowledgments

I sincerely thank Dr. Siti Suhaily, who guided my research methods and greatly encouraged me. I also thank the teacher and student for the notification of submission.

Paper Contribution to Related Field of Study

From the perspective of jewelry design, the composition, properties, aesthetics, and craft of Zisha clay are discussed; Zisha clay is more accessible and environmentally friendly than traditional jewelry materials. However, its recognition in the field of ceramic jewelry still needs to improve. This study has reference value for promoting the development of the creative industry.

References

Bilgilia, B., Ercis, A., Ünal, S. (2011). Kano model application in new product development and customer satisfaction (adaptation of traditional art of tile making to jewelries), Procedia Social and Behavioral Sciences, 24 (2011) 829–846.

Duangkhachon, K. & Kamon, O. (2018). The Development of Dan-Kwian Ceramic Jewelry for Contemporary Aesthetics in Nakhon Ratchasima Province. Key Engineering Materials. ISSN: 1662-9795. Vol. 766, (pp 44-50). doi:10.4028/www.scientific.net/KEM.766.44.

Gowlland, G. (2016). Style, Skill and Modernity in the Zisha Pottery of China. The Journal of Modern Craft. ISSN: 1749-6772 (Print) 1749-6780 (Online) Journal homepage: http://www.tandfonline.com/loi/rfmc20. 129-141.

Kutsenko, L. E. & Arventyeva, N. A. (2017). Mixed technologies of artistic ceramics processing for jewelry manufacture. International Conference on Information Technologies in Business and Industry. Series: Journal of Physics: Conf. Series 803 (2017) 012087. doi:10.1088/1742-6596/803/1/012087.

Lingling, J. (2015). Brief description of the craft characteristics of purple clay and purple clay pottery.

Mahendri, C. D., Anggoro, P. W., Fergiawan, P. K., Yuniarto, T., Bayuseno, A. P., & Jamari. (2020). Development of the Ceramic Jewelry Industry for Necklace with Indonesian Batik Motifs. Advances in Engineering Research. Proceedings of the 2nd Borobudur International Symposium on Science and Technology (BIS-STE 2020).

Minglong, M. (2011). The role of purple clay and its influence on color. Foshan Ceramics.

Mishra, S. P., Gujar, U. S., Das, L. K., Bansod, L., & Bhalshankar, S. P. (2013). Natural Colours for Terracotta Jewellery. International Journal of Scientific and Research Publications. ISSN 2250-3153 ,www.ijsrp.org.

Onal, P.B. (2012). Op-art and personal practices in contemporary ceramic art, Procedia - Social and Behavioral Sciences, 51 (2012) 655 – 661.

Stamatia, V., Antonopoulosa, G., Azariadisb, P., Fudosa, I. (2011). A parametric feature-based approach to reconstructing traditional filigree jewelry. Computer-Aided Design, 43 (2011) 1814–1828.

Suhaily, S. S., Gopakumar, D. A., Aprilia, N. A. S., Rizal, S., Paridah, M. T., and Khalil, H. P. A. (2019). Evaluation of Screw Pulling and Flexural Strength of Bamboo-base Oil Palm Trunk Veneer Hybrid Biocomposites Intended for Furniture Applications. Bamboo hybrid. BioResources 14(4), 8376–8390

Thompson, F. (2011). Producing ceramic art works though tourism research. Annals of Tourism Research. Vol. 39, No. 1, (pp. 336–360), 2012 0160-7383/.

Tianhui, C. (2017). Green life, sustainable design. Popular Literature and Art, (19): 101-102.
World Platinum Investment Council (WPIC). (2023). Platinum Quarterly.

Wu, J., Hou, T., Zhang, M., Li, Q, Wu, J., Li, J., Deng, Z. (2013). An analysis of the chemical composition, performance and structure of China Yixing Zisha pottery from 1573 A.D. to 1911 A.D.. Ceramics International, 39 (2013) 2589–2595. http://dx.doi.org/10.1016/j.ceramint. 2012.09.021.

Xiaowen, Z. (2023). Ceramic jewelry design and production. Nanjing: Jiangsu Phoenix Art Publishing House. ISBN 978-7-5741-1003-9.

Yang, A. (2016). Jewelry Materials Application Guide. Shanghai People's Publishing House, ISBN:9787532265336.

Zhiwei, C. (2013). On Yixing purple clay. Market Weekly.

Zhu, J., MacDonald, B. L., Hang, T., Zhu, Z., Glascock, M. D. (2019). Compositional characterization of Zisha clay from the Yixing area (Jiangsu, China) by neutron activation analysis. Microchemical Journal, 147 (2019) 1117–1122.

Jiang Yongjun, He Jiao Yue. (2023). Research on the application of purple sand material in jewelry field. Ceramic science and art. ISSN:1671-7643. CN: 43-1375/TS

Jiang Feifei. (2024). Zisha crafts future development prospects. Shanghai light industry. ISSN:1004-3772

A surname. (2022). Analysis of Yixing purple sand technology. A taste of art. ISSN:2095-2406, CN:61-1485/J

He Jiayi. (2022). Research on the evolution history of Zisha clay material in Yixing. Ceramics. ISSN:1002-2872, CN:61-1143/TU

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Bamboo Installations Design as an Appreciation of Local and Environmentally Friendly Materials

Vanya Alessandra Leonardo*, Amadea
**Corresponding Author*

Interior Design Department,
Universitas Pelita Harapan, Jakarta, Indonesia

vanya.tjioe@uph.edu, amadea.sod@uph.edu
Tel: +628111995308

Abstract
Bamboo, an abundant and sustainable material in Indonesia, has diverse applications, from crafts to construction. This study introduces bamboo's unique characteristics and its potential for development in art, crafts, and monumental works, emphasizing its fast growth and structural durability. In studio learning, bamboo's flexibility and natural inspiration foster innovative, organic designs that reflect contemporary aesthetics. These designs, realized in public spaces, not only promote bamboo's environmental benefits but also serve as educational tools, showcasing its value as a locally sourced, eco-friendly material with broad potential for artistic and structural applications.

Keywords: Local material; bamboo design; bamboo installation; studio learning

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6168

1.0 Introduction

Bamboo plants are widely utilized because they are easily found across various geographical conditions, from low to highlands, and in various climates, both tropical and subtropical climate zones. There are 176 bamboo species in Indonesia out of 1439 bamboo species worldwide. This means nearly 10% of bamboo species worldwide are found in Indonesia. Indonesia is estimated to have over 1 million hectares of bamboo plants, but only 25,000 hectares are managed as bamboo plantations. The rest grow freely and sporadically (Setiawan, 2023). Bamboo, known as the "green gold grass," is one of the fastest-growing plants on the planet, capable of growing up to 1.2 meters per day (Muttaqin et al., 2023). Bamboo has a relatively fast life cycle, with only 3 to 4 years of harvest time. Bamboo is a plant that, once planted, can be harvested throughout its lifetime because it grows continuously (Kementerian Koordinator Bidang Perekonomian Republik Indonesia, 2021).

Using bamboo as a material can have a good impact on society. Conserving traditional bamboo handling skills is possible while creating new income opportunities by developing a bamboo-based construction industry. The skills of local people can be increased, which in turn will support them in income generation. The rise of the bamboo industry significantly promotes economic growth and increases people's income. In the craft industry (a combination of arts and crafts) in Indonesia, bamboo is a material that has the

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6168

tremendous economic potential to enter the export market of countries that apply these 'environmentally friendly' considerations because: (1) it does not damage the environment; (2) has a relatively short production period of 3-5 years; and (3) is multi-functional (versatile) (Pramono et al., 2021).

The vast potential of bamboo as a material for both crafts and construction makes bamboo worthy of being one of the primary materials in Indonesia, whether in small products such as craft or furniture or even in buildings. This study aims to introduce the unique characteristics of bamboo as a material with potential value to be developed into many kinds of works, whether in art, craft or monumental works. These works will serve as agents to promote bamboo as one of the abundant and easily found local, sustainable and environmental friendly materials in Indonesia, considering the fast growth rate and durability of structures built using bamboo. The challenge in promoting bamboo as a versatile material to replace conventional building materials such as wood, concrete, and steel depends on how far designers and artists produce the design and how great the ability of local craftsmen who will produce the design using bamboo that is unique, contemporary, and at the same time, attract attention. To produce unique and compelling works that promote and empower the use of bamboo as the primary material requires creativity to create designs that differ from those currently available in the market.

One of the learning experiments in foundational studio studies at Interior Design UPH is balancing form, content, and context in design by using hands-on experience to juggle material knowledge and the making process. The final project from the class was to create a human-sized installation project that can be used as a design for a space in the public area and provide a certain experience for the user of that public space using bamboo as the primary material. In the design process, students are guided to develop their ideas based on their inspiration from nature, which typically features organic characteristics that align with bamboo's bendable and flexible nature. The design produced by students is expected to showcase the distinctive characteristics of bamboo through their installation forms.

In this class installation project, the resulting work is designed to be placed in a public space to encourage engagement between visitors and the public space. The installation, designed using bamboo, leverages bamboo's flexible and easily bendable characteristics to achieve a design outcome inspired by nature, which tends to feature more organic and less geometric forms, mimicking nature's characteristics. In designing the installation, the form is expected to showcase the uniqueness of bamboo as a material, beyond its typical processing and shaping, highlighting the distinctive methods of bamboo treatment compared to other materials. This aims to create a more relevant installation design for the visitors. The student's installation is placed in a publicly accessible space where it can be visited and enjoyed by the general public to serve as an educational agent and promote bamboo's unique qualities as a substitute for conventional materials as building materials. As future designers who will create works in the future, introducing bamboo to students is an effort aimed at gradually fostering an appreciation for the versatility of bamboo as a material and encouraging them to continue designing with it. Ultimately, the increasing number of design works using bamboo will symbolize the success of making bamboo one of the main materials in Indonesia.

2.0 Literature Review

Indonesia has enormous potential to develop the bamboo industry because of its abundant availability. The community utilizes it for daily needs, crafts, and weaving, as well as as a traditional building material. The young shoots of bamboo, known as 'rebung,' can be used as a food ingredient. Bamboo has been utilized as a household appliance and building material since ancient times, particularly by those living where bamboo grows naturally and abundantly. Some utilize bamboo as a craft material for its elasticity and flexibility, which makes it easy to transform into crafts in the form of decorations or furniture. Many foreign tourists are interested in the beauty and uniqueness of bamboo crafts, thus opening up opportunities for exports to various countries. Cultivating, processing, designing, and producing high-quality bamboo products can increase exports and foreign exchange income (Shukla & Joshi, 2020).

Because of its innate strength and flexibility, bamboo has been utilized as a building material since ancient times. Bamboo is easy to shape, and its price is lower than wood. Using bamboo as a building material can reduce pressure on natural resources and have a lighter environmental impact than conventional building materials such as concrete and steel. Bamboo has good resistance to wind and temperature changes but can be susceptible to decay if submerged in water for a long time. Therefore, choosing the right type of bamboo and applying special treatments to bamboo before and during the construction process are crucial factors in ensuring the optimal performance of bamboo in structures. Compared with other building materials, bamboo structures have weaknesses in strength and durability. However, these can be overcome by considering more flexible designs and employing innovative construction techniques. Furthermore, bamboo's advantages in terms of environmental sustainability and lower construction costs make it an attractive alternative to consider in residential building construction, especially in areas abundant with bamboo resources (Honta, 2024).

In addition to benefiting the economy and culture, bamboo contributes to environmental conservation. Bamboo has gained recognition for its versatility and sustainability. From its easy growth to its remarkable strength and durability, bamboo has become a valuable resource for construction purposes. Ecologically, bamboo plants help maintain balance as their roots prevent erosion and control groundwater (Putro et al., 2014). Bamboo is beneficial to the environment because it produces more oxygen than equivalent tree strands, reduces light intensity, protects from ultraviolet rays, is an essential atmospheric land and soil purifier, and its roots can minimize soil erosion by up to 75% (Sharma et al., 2016). Bamboo can produce 30% more oxygen than other trees (Basari & Pari, 2017). Bamboo is a source for sustainability and maintaining the ecological balance (Liu et al., 2012). Bamboo can also be processed into clothing using its bamboo fiber. With the help of technology, bamboo can also be utilized as a raw material for paper production. The versatility of bamboo materials has been known and utilized for a long time up to the present day.

In the existing literature, the term art installation generally refers to artwork executed in public in openly accessible locations, different than the conventional museum and gallery. Some are situated permanently at a site: a monumental statue or a bespoke sculpture. Others are for temporary situations in a specific place and at a specific time, as in the case of a public art festival. Public art can be aggressive, abstract, symbolic, decorative, and aesthetic (Adina & Cuffie, n.d.). Artists create it for different reasons. It can take a wide range of forms, sizes, and scales and can be temporary or permanent. It often interprets the history of the place and its people and addresses a social or environmental issue. Public art includes murals, sculptures, memorials, integrated architectural or landscape architectural work, community art, digital new media, and performances and festivals. Recent literature on installation art stresses that public art installation is structured around the beholders, who are invited to explore their spaces and the objects possibly placed within them. Installation art can prompt the public to engage in various actions (Caldarola, 2020).

This project will use a specific method adapted from the journal 'A Strategy to Support Experience Design Process: The Principle of Accordance', which discusses how the process of implementing experience design is carried out. This method is in accordance with the learning process in the design studio class, where hands-on experiments are prioritized to improve the learning experience (Camere & Bordegoni, 2015).

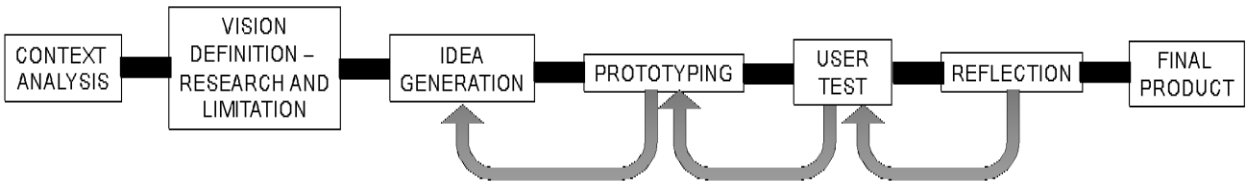


Fig. 1: Adaptation of Design Process
(Source: Camere & Bordegoni)

3.0 Methodology

In designing this bamboo installation for public space, based on Figure 1 steps above, students will carry out a process like this:
(1) Class content given.
(2) Students observe the specific public area to convey the context and produce the best design for the space by conducting a thorough site analysis. This process is in accordance with the 'Context Analysis' and 'Vision Definition' processes in Figure 1. While observing, students interact with users in the public space where the installation will be built to get information that could help design the installation.
(3) Students propose the installation design in groups regarding the content and context data from observation, in accordance with the 'Idea Generation' process in Figure 1.

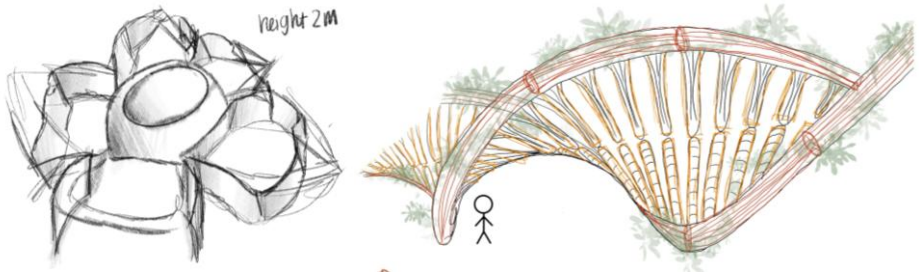


Fig. 2: Design Ideation Inspired by Nature
(Source: Student Works)

(4) To enhance form, students began to make prototypes of the design ideas formulated in accordance with the 'Prototyping' and 'Test' process in Figure 1. Prototypes with a scale of human proportions were made to facilitate and test usage analysis and installation design.

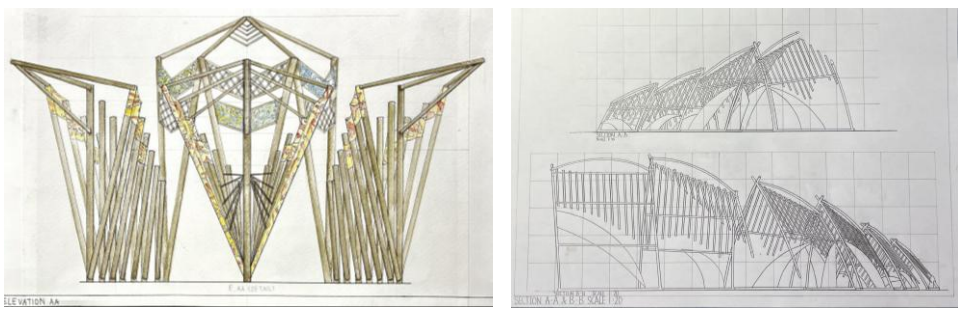


Fig. 3: Working Drawing
(Source: Student Works)

Fig. 4: Prototyping
(Source: Student Works)

(5) Students built the installation in collaboration with the local bamboo craftsmen. After the installation was completed, the students conducted a post-test using a questionnaire and interviews to obtain feedback on the design of the installation they created in accordance with the 'Reflection' and 'Final Product' processes.

Fig. 5: Result
(Source: Student Works)

Through this process, the interaction between teacher and student is in the form of brainstorming and discussions while experimenting to get the best design results that are used as solutions to the design problems obtained.

4.0 Findings

This project of utilizing bamboo to produce installations has been going on since 2018. At first, this activity only involved local bamboo craftsmen providing a workshop and insights into local bamboo processing techniques in crafts for students. This workshop was held with the aim of honing students' hands-on experiments and skills on bamboo materials. The involvement of local bamboo craftsmen in this activity is to expose the techniques and works of local bamboo crafts as a form of introduction to students. In this workshop, the introduction of techniques only extends to the manufacture of craft objects, emphasizing the use of bamboo material, which is no longer shaped like real bamboo but is already made of thin and flexible material.

Fig. 6: Early Bamboo Workshop with Local Craftsmen
(Source: Class Activities)

Activities then developed in 2019, where workshops were conducted while involving local bamboo craftsmen with a higher learning intensity. In this activity, the craftsmen share knowledge about construction techniques using bamboo to produce a design by taking inspiration from nature, which tends to have an organic shape. This is an emphasis on the use of bamboo materials that try to escape from the grip of traditional forms of construction so far. In the use of bamboo in traditional construction systems, most of the bamboo construction is used to create geometric shapes, for example, as in hut buildings such as *saung* or *pendopo*. Meanwhile, the character of the bamboo material, which tends to be easy to bend and flexible, is better used to form not only geometric shapes but also more organic and curved shapes. Recently, buildings with bamboo materials have begun to appear, using curved designs that also apply constructions that can accentuate the curved shape, especially in tourist areas like Bali; there is a growing trend of villas and restaurants using contemporary designs using bamboo materials. However, most of the newly built structures are limited to simple single-story buildings.

Designs that utilize the characteristics of bamboo, which are easy to bend and flexible, can help produce designs that are more contemporary and unique, either on craft or buildings. The use of the flexible character of bamboo is often applied to craft objects but is rarely used in construction because there are still few bamboo building designs that use curved shapes. Organizing bamboo processing workshops involving students and local craftsmen focusing on bamboo construction influences the shape of the installations designed by the students. The installation design from this period was greatly influenced by the thin and flexible character that wrapped around the robust main structure to mimic its inspiration from nature. For example, thin materials arranged horizontally to depict the shape of a shell or thin bamboo weaving to form the configuration of a turtle's body.

Fig. 7: Installation Results from 2018 and 2019
(Source: Student's Installation)

In 2023, The development began with the creation of more modular and proportional installation forms tailored to the proportions of their users' bodies. One of the installations produced during this period was used as a display to showcase the collaborative work between a Japanese bamboo artist and local bamboo craftsmen at an event held in one of the shopping malls in Jakarta. In this collaboration, the Japanese bamboo artist and local craftsmen showcased the unique bamboo processing techniques from their respective regions, which were then applied to crafting handmade objects. The students' installation was used as a display for this collaboration because its design was considered fitting for the bamboo craft theme and could harmonize with the design of the collaborative artworks.

The installations created during this period are heavily influenced by modular forms to achieve two objectives: first, as installations themselves, and second, where one of the installation modules can serve as a display for exhibits. Some of the designs produced by students utilize a 2-layer system, where the first layer constitutes the main structure, and the second layer, placed on its facade, serves as accents that enhance the aesthetic value of the installation.

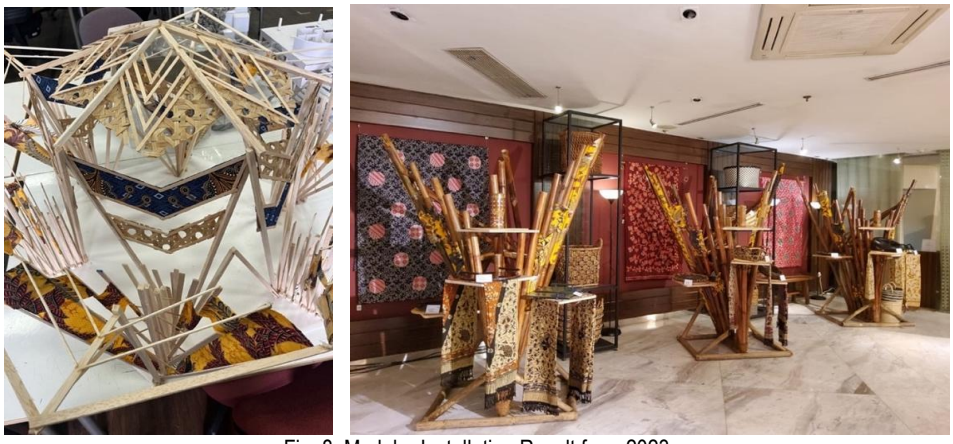


Fig. 8: Modular Installation Result from 2023
(Source: Student's Installation)

Another installation caught the attention of a bamboo park in Tangerang and was placed there. In this location, the installation is frequently used by children aged 4-12 years for activities similar to those in a playground. The bamboo park itself is a public park under the auspices of the Dinas Kebudayaan dan Pariwisata, appropriately themed around bamboo as reflected in its name. The bamboo installation placed in this location has successfully stood firm until 2024, demonstrating that bamboo's durability as a construction material for installations has been quite successful. However, compared to the durability of conventional building materials, bamboo still needs to match the resilience of conventional building materials since it could decay faster than conventional building materials.

Fig. 9: Installation Result from 2023
(Source: Student's Installation)

In 2024, this project began with a different approach, considering a collaborative location where the installation would be placed before designing it, ensuring that the resulting design is relevant to its location. The chosen location is not explicitly related to bamboo, aiming for the displayed installation to be unique and different while highlighting bamboo as a new material theme. As an illustration, one of the locations is situated near the beach, inspiring the design to be based on the shape of a sea creature, specifically a conch shell. The resulting design is dominated by curved forms resembling a dome, similar to the shape of a conch shell. The installations during this period are placed in public spaces that are frequently visited, allowing many people to enjoy them, especially young children who are naturally curious and eager to interact using their sense of touch with unique objects in their perspective.

Fig. 10: Installation Result from 2024
(Source: Student's Installation)

The presence of installation design in public spaces successfully fosters interaction between visitors and the installation. Simple interactions occur, for example, when visitors capture the shape of the installation using their cameras. A deeper interaction emerges when visitors' curiosity invites them to enter the installation. By entering the installation, the success of the installation in introducing the

use of bamboo as a material is already considered quite successful because visitors can experience being under a creation made of bamboo.

5.0 Discussion

In the design and installation process, several factors influence the form of the installation. The initial design created by students uses sketches that are later developed into prototypes and ultimately translated into working drawings to be used as references in constructing the 1:1 scale installation. Design testing is first carried out on the prototype, using human-scale models representing the users or visitors who will eventually interact with the installation. During this testing phase, considerations include how users or visitors enter, move within, and exit the installation. Interaction possibilities between users or visitors and the installation are also examined. Prototypes are crucial for assessing the feasibility of constructing the full-scale installation (1:1). Efforts are made to replicate the original installation conditions as closely as possible during prototype construction to minimize issues during installation.

The results from prototype testing are used to refine the installation design. Several student designs undergo development during this phase. Once the prototypes and drawings are finalized, construction of the 1:1 installation begins. Throughout this project, students learn how initial design ideas, initially conceptual, are developed, tested, and refined until successfully built and utilized by the public. During the installation process, students also study how local craftsmen employ bamboo processing techniques to be integrated into their designs, thereby promoting bamboo processing techniques, such as joints, within their installation.

6.0 Conclusion and Recommendation

In creating installations that serve as agents in promoting bamboo as a substitute for conventional materials, several challenges are faced, including:

(1) Local craftsmen have strong skills in bamboo processing techniques but often need more creativity in design.

(2) Design students possess creativity and strong design skills but often need more skills and knowledge about bamboo construction techniques.

(3) The location of the installation influences the success of promoting bamboo's advantages as a local and environmentally friendly material.

The success of using installations as promotional agents for bamboo as a local and environmentally friendly material heavily depends on collaboration among designers or artists and local craftsmen to produce more advanced works using bamboo materials with more advanced processing and manufacturing techniques. Designers or artists need to have skills and knowledge in bamboo joining and construction techniques, which can be obtained from local artisans. The transfer of such knowledge or skills needs to be done regularly and periodically. With the abundance of local bamboo artisans in each region, it is not difficult to collaborate with local artisans in the designer's creative process.

There are still many aspects of bamboo's uniqueness that have not been explored. For example, each region has distinctive methods and techniques for processing, joining, and constructing bamboo. In Indonesia, there are numerous traditional methods and techniques for bamboo processing, joining, and construction that have been passed down through generations by local artisans in each region. The uniqueness of methods and techniques from each region produces works with different aesthetic qualities. In promoting bamboo as a substitute for conventional materials, these distinctive methods and techniques can be leveraged, or even combined from various regions to create a composition that differs from what has existed so far.

Acknowledgments

This paper and the community service-learning activities would not have been possible without the support and funding from the Interior Design Department – Faculty of Design and Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM) Universitas Pelita Harapan. We would also like to express our gratitude and appreciation to Dinas Kebudayaan dan Pariwisata Kota Tangerang, Indonesia Design District PIK2, and The Breeze BSD, which allows our installations to engage within their community. This paper was developed efficiently thanks to the hard work of first-year students from the 2017, 2018, 2022, and 2023 cohorts, as well as the teaching team from the Interior Design Department – Faculty of Design, Universitas Pelita Harapan, in understanding bamboo as a material and creating great works using bamboo.

Paper Contribution to Related Field of Study

This paper contributes to the study on (1) the use of art installations as an agent to introduce bamboo as a local and environmentally friendly material that can replace conventional materials such as wood and steel; and (2) the application of the experience design process method in-studio learning that emphasize hands-on experimentation while utilizing the advantages of the material in designing artworks.

References

Adina, H., & Cuffie, T. (n.d.). Public Art and The Impact It Has on The Society. *Journal of Contemporary Indonesian Art*, *7*(2), 2021.

Basari, E., & Pari, R. (2017). Sifat Fisis dan Pengeringan Lima Jenis Bambu. *Jurnal Penelitian Hasil Hutan*, *35*(1), 1–13. https://doi.org/10.20886/jphh.2017.35.1.1-13

Caldarola, E. (2020). On Experiencing Installation Art. *The Journal of Aesthetics and Art Criticism*, *78*(3), 339–343. https://doi.org/10.1111/jaac.12734

Camere, S., & Bordegoni, M. (2015). A strategy to support Experience Design process: the principle of Accordance. *Theoretical Issues in Ergonomics Science*, *16*(4), 347–365. https://doi.org/10.1080/1463922X.2015.1014069

Honta, Z. L. (2024). *Analisis Kinerja Struktur Bambu Sebagai Alternatif Ramah Lingkungan Dalam Pembangunan Bangunan Hunian*.

Kementerian Koordinator Bidang Perekonomian Republik Indonesia. (2021, May 4). *Pengembangan Bambu Berkelanjutan*. Ekon.Go.Id.

Liu, D., Song, J., Anderson, D. P., Chang, P. R., & Hua, Y. (2012). Bamboo fiber and its reinforced composites: structure and properties. *Cellulose*, *19*(5), 1449–1480. https://doi.org/10.1007/s10570-012-9741-1

Muttaqin, Z., Rusli, A. R., & Supriyanto, B. (2023). The potential of bamboo and the contribution of bamboo craftsmen to the community's income in Cibadak Village, Bogor City, Indonesia. *Biodiversitas*, *24*(10), 5796–5807. https://doi.org/10.13057/biodiv/d241062

Pramono, R., Hidayat, J., Dharmawan, C., & Juliana. (2021). Hybrid bamboo and batik handicraft development as creative tourism product. *International Journal of Design and Nature and Ecodynamics*, *16*(5), 601–607. https://doi.org/10.18280/ijdne.160515

Putro, D. S., Jumari, & Murningsih. (2014). Keanekaragaman Jenis dan Pemanfaatan Bambu di Desa Lopait Kabupaten Semarang Jawa Tengah. In *Jurnal Biologi* (Vol. 3, Issue 2).

Setiawan, A. (2023, March 13). *Bambu sebagai Mitigasi Perubahan Iklim*. Indonesia.Go.Id.

Sharma, P., P, S., & KP, S. (2016). Diversity, Uses and In vitro Propagation of Different Bamboos of Sonitpur District, Assam. *Journal of Ecosystem & Ecography*, *6*(2). https://doi.org/10.4172/2157-7625.1000184

Shukla, P., & Joshi, M. (2020). *Social, Environmental and Economic Impact of Promoting Bamboo Furniture Industry in India* (Vol. 19, Issue 2). www.jbronline.org

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organized by: Institut Seni Indonesia, Yogyakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Mountains and Rice Fields: Curating painting and environmental issues through the "Landscape of Nation" exhibition

Mikke Susanto

Institut Seni Indonesia Yogyakarta,
Yogyakarta, Indonesia

susantomikke@gmail.com
Tel: +6289651318766

Abstract
History has recorded many natural disasters caused by mountains in Indonesia. "Landscape of Nation" exhibition at the Basoeki Abdullah Museum explores the issue of mountains and rice fields. This research explains the curatorial exhibition. The research employs a descriptive qualitative method. Sixteen paintings in the exhibition were used to cultivate public appreciation for environmental issues. Research on the theme of mountains and rice fields greatly impacts Indonesian art society. This research significantly contributes to education, particularly in the humanities, art studies, natural sciences, and museology.

Keywords: Curatorial; landscape painting; art exhibition; art and environmental issues

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6151

1.0 Introduction

Southeast Asian islands, including Indonesia, owe their formation to a subduction. The subduction, which began tens of millions of years ago, involved the collision of the Indo-Australian oceanic plate with the Eurasian continental plate (Hall et al., 1996). This process fuelled the creation of a chain of volcanoes ringing the Pacific Ocean. Naturally, the presence of these numerous mountains has a profound impact on the region's entire ecosystem.

Human civilization emerged in Indonesia thousands of years ago. However, comprehensive written records of natural disasters in Indonesia only date back to the arrival of Europeans roughly 400 years ago. Unfortunately, written accounts of natural disasters in Indonesia only record post-classical catastrophic events (Yulianto, 2021). Earlier records exist but are scarce and fragmentary, like references to volcanic eruptions and earthquakes in the *Negarakertagama* (Mulyana, 1979).

Mountains play a profound role on a cosmological scale. They shape life and culture while also holding the power to devastate civilizations. Mountains, cradling the civilization of rice fields, are often viewed as both a challenge and a life therapy or life balancer. Mountains and rice fields have become essential for humans, providing a vital food source. Every human depends on rice fields, which require continuous and sustainable planting cycles and care despite the occasional setbacks and disasters.

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6151

The history of human life has been radically transformed since the adoption of agriculture. Rice fields (and mountains) led humans to abandon nomadic lifestyles. Humans tend to the fields and use their downtime for various crafts or activities. Mountains and rice fields have become recognized as symbols of the birth and development of culture (read: humanity).

The present article is driven by the growing recognition of art and creativity as powerful forces for social and environmental change. Interdisciplinary collaboration between art and the environment is crucial for tackling humanity's complex challenges. Art functions as an aesthetic medium and an educational and advocacy tool, influencing environmental and social policies. Exploring and understanding art in this context is key to contributing to environmental balance and human well-being.

It should be noted that art exhibitions serve a vital public function. They facilitate knowledge transfer and public advocacy on various issues. Furthermore, historical records of natural disasters caused by mountains are widely circulated. These historical records inspire artists in their works. Artists present their visions and messages about mountains in art exhibitions. The art exhibition "Landscape of Nation" at the Basoeki Abdullah Museum in 2011 explores the issue of mountains and rice fields. The aim is to mediate topics and studies about the natural environment, especially mountains and rice fields.

2.0 Literature Review

2.1 Curator and Curation

A curator acts like a catalyst, a substance that brings elements together. Curators bring together artists and audiences in an exhibition. They play the role of dialogue builders, weaving together various factors in an exhibition. In fact, "curating" has been more like direct discourse uttered by a respected person in an exhibition. From this opinion, it can be argued that curation is a work of "considering space": bringing together artists' works and the market-media-public in a discourse-atmosphere-place of an exhibition. Of course, curation also includes research on texts and objects, conceptualization, interpretation, planning, and promotion of exhibitions or collections. It could be said that curation is the core and main work behind exhibition management (Susanto, 2016).

2.2 Landscape Painting

Landscape painting, derived from the Dutch word "*landschap*", depicts natural scenery, typically featuring mountains, trees, rivers, ravines, and forests. Sky and climate are also key elements that shape the composition. Since the 1st century BC, Roman frescoes depicting scenic views have graced the buildings of Pompeii and Herculaneum. Landscape painting traditionally depicts the Earth's surface, but it can also encompass otherworldly views like moonscapes. By the early 15th century, landscape painting had emerged as an established genre in European art. The term "landscape painting" entered the English dictionaries in the 17th century (Susanto, 2018).

Landscape painting has played an essential role in human life from the prehistoric era to the present. However, a natural landscape is more of a visible, factual, realistic panorama of existing environmental elements (Baomar, 2020). "Landscape" refers to a vista or a bounded land area and its painted representation (Palma, 2016).

2.3 Art Exhibition

"Exhibition" can encompass conventions, expositions, forums, shows, and displays. The terms "exhibition" and "display," for example, are used interchangeably by anyone concerned, particularly in the world of economy and promotion. While the traditional distinction between "display" as a verb and "exhibition" as a noun (for example, to display in an exhibition) remains in dictionaries, the lines are blurred in everyday practice. In art jargon, both "exhibition" and "display" are referred to as "exhibition," even though subtle distinctions exist between them (Susanto, 2024: 31).

An exhibition is a strategic system of representation. This system organizes exhibitions to represent the optimal and engaging use of everything. This includes exhibition architecture that is always "political" (corresponding to "art as political"), "painting the walls" (read: installation or display of artworks) that is always full of psychological purposes, labels (of artworks) that are always educational, artistic presentations that are always full of ideological and structural power within their limited statements, dramatic lighting, security systems that are always a form of social security, and curatorial premises that are always dogmatic and professional (Ferguson, 1996).

2.4 Art and Environmental Issues

The relationship between environment and art is constantly evolving. According to Thornes, "environment" and "art" are subject to ongoing reinterpretation. Art evolves with new media. Environmental issues dominate political, economic, and scientific discourse, particularly climate change. The relationship between art and the environment can influence feelings about humans' daily experiences in the world (Thornes, 2008), including the negative impacts of ecological damage. Therefore, Thornes encourages us to appreciate both the beauty and fragility of our environment and our cultural responses to it. Among other things, it is essential to examine how past and present artists have depicted the environment in their paintings.

Anggrian and Iksan (2020) identified at least six personal motivations driving artists to create art centered on environmental awareness. These motivations include (1) personal spiritual practice, (2) positioning art as a cultural event, (3) empowering personal existence for society and the environment, (4) involvement in art projects to empower society, (5) building community awareness and sharing values, and (6) preserving local wisdom traditions.

3.0 Methodology

This research is descriptive and qualitative. It focused on curating an exhibition organised by the Basoeki Abdullah Museum and Mikke Susanto, held on 24 September–22 October 2011. Primary data for this research consisted of observations, interviews, and documentation collected by the curator. Observations were conducted through visits and discussions with participating artists. Subsequently, an exhibition was held to disseminate knowledge related to the main topic. Additional observations were conducted at the exhibition venue, the Basoeki Abdullah Museum. Interviews were conducted with each participating artist. The documentation technique was used to identify the values embedded in the mountain and rice field-themed exhibition. Data analysis employed Miles and Huberman's (2005) interactive qualitative analysis, involving data collection, reduction, display, and conclusion drawing.

4.0 Findings

In art, mountains and rice fields have served as an inexhaustible source of inspiration for landscape painting artists in Europe and Indonesia. Landscape paintings frequently feature mountains, rice fields, and mountains and forests (trees) as central elements. When interpreted by different artists, the same subject matter arises in diverse contexts. In the art exhibition "Landscape of Nation," the curator, through his curatorial practice, proposes a thesis exploring the theme of mountains and rice fields across various contexts. The following are intriguing findings regarding the diverse contexts in which mountains and rice fields are depicted in paintings:

4.1 Mountains & Rice Fields in the Context of Tradition and Romanticism

Table 1.

No.	Description of Painting	Photograph of Painting
1.	Basoeki Abdullah, *Sungai Tak Pernah Kembali*, 125x200 cm, oil on canvas, date undetermined.	
2.	Wakidi, *Danau*, 70x128 cm, oil on canvas, c. 1930	
3.	Ernst Dezentje, *Pemandangan*, 70x50 cm, oil on canvas, date undetermined.	

(Source: The catalog of the exhibition "Landscape of Nation", the Basoeki Abdullah Museum, 2011)

Within tradition and romanticism, the paintings of Abdullah Sr., Basoeki Abdullah, Wakidi, and Ernst Dezentje are prime examples. These painters expanded upon the academically established conventions and traditions of landscape painting as upheld by European educational institutions. They prioritized dynamic and static compositions aimed at constructing new worlds to emotionally engage viewers as they observed the realities of mountainous and rice field landscapes. The reality these painters envision is rooted in romanticism (dramatic imagination or fantasy), emphasizing the sublime qualities of nature as both subject and object. In their works, we will not find anything deemed "ugly or useless" (such as electric poles or dilapidated houses). Their works exclusively present "the beautiful."

4.2 Mountains & Rice Fields in the Context of Nationalism

Table 2.

No.	Description of Painting	Photograph of Painting
4.	Dullah, *Menyambut Konferensi Asia Afrika*, 150x80 cm, oil on canvas, 1964	

(Source: The catalog of the exhibition "Landscape of Nation", the Basoeki Abdullah Museum, 2011)

The context of nationalism is proposed as a curatorial framework for paintings that depict mountains and rice fields as both the setting and the medium for expressing nationalist sentiments. Nationalism, in this context, refers to an attitude that prioritizes the emergence of a desire for unity among individuals to achieve national goals. The central theme is Indonesian independence, linked to mountains as battlegrounds against colonial powers. Dullah's collaborative work, *Menyambut Konferensi Asia Afrika* (1964), is pivotal in this context.

4.3 Mountains & Rice Fields in Religious Context

Table 3.

No.	Description of Painting	Photograph of Painting
5.	Rustamadji, *Sunyi Sepi Permai Damai*, 120x82 cm, watercolor on paper, 1964	
6.	Ahmad Sadali, *Gunungan*, 61x52 cm, mixed media on paper, 1976	

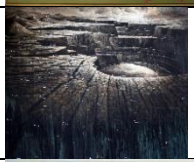
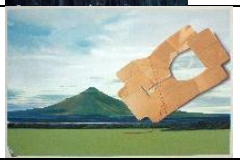
(Source: The catalog of the exhibition "Landscape of Nation", the Basoeki Abdullah Museum, 2011)

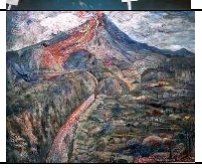
This context posits the thesis that mountains serve as a significant symbol in the lives of various communities across the Indonesian Archipelago, particularly in Java, Bali, and Sumatra. Mountains are associated with notions of safety, balance, and religiosity. This religious framework represents mountains as *gunungan* (carved and painted mountain-shaped objects in traditional Indonesian puppetry). The *gunungan* symbolises life, often depicted as the Tree of Life inhabited by a menagerie of forest creatures such as tigers, bulls, monkeys, and peacocks.

At the base of the *gunungan*, a depiction of a *joglo* (a traditional Javanese house) is typically found. On either side of the *joglo*, enormous dragons are portrayed baring their fangs. The *gunungan* is rooted in a conception of divinity symbolized by the universe. The evolution of tradition and traditional arts has solidified the role of the mountain or the *gunungan* within the framework of divinity. The paintings of Rustamadji and Ahmad Sadali contribute to this discourse in a more modern context. Both artists dedicated their artistic skills to depicting mountains to remind us of the concept of divinity.

4.4 Mountains & Rice Fields in the Context of Social Documentation and Global Issues

Table 4.

No.	Description of Painting	Photograph of Painting
7.	D. Zawawi Imron, *Renungan di Tengah Alam Madura*, 2011	
8.	Dyan Anggraini, *Now to Know*, 120 x 150, 2011	
9.	Januri, *Nation of Landscape*, 150x150 cm, acrylic on canvas, 2011	
10.	Julnaidi MS, *Terbentang dan Terpotong*, acrylic on canvas, 2011	

11.	Rinaldi, *Gunung II*, acrylic on canvas, 2011	
12.	Totok Buchori, *Reboisasi*, 85 x 70 cm, oil on canvas, 2011	
13.	Widayat, *Tanggal 22 Nop. 1994*, *Merapi Meletus*, 145 x 178 cm, 1994	

(Source: The catalog of the exhibition "Landscape of Nation", the Basoeki Abdullah Museum, 2011)

Mountains and rice fields are the treasures of the Indonesian nation. They are the very breath of Indonesia. What will happen if mountains and rice fields are no longer in ecological balance? Undoubtedly, Indonesia will face numerous challenges and problems. In this context, the primary theme is the issues arising from human activities that disrupt the ecological balance of mountains and rice fields. Conditions such as deforestation and the shrinking or drought-stricken state of rice fields are realities frequently depicted by painters. D. Zawawi Imron, Dyan Anggraini, Hanafi, Januri, Julnaidi MS, Rinaldi, Totok Buchori, and Widayat are among the artists who address the problematic issues faced by our mountains and rice fields.

4.5 Mountains & Rice Fields in Personal and Fantastical Context

Table 5.

No.	Description of Painting	Photograph of Painting
14.	I Ketut Susena, *Nafas Merapi*, 145 x 200 cm, acrylic on canvas, 2011	
15.	Aidi Yupri, *Ladang Tanda*, acrylic on canvas, 2010	
16.	Yon Indra, *Ilusi Ruang dalam Terawang IV (seri relief)*, d. 80 cm, mixed media on canvas, 2011	

(Source: The catalog of the exhibition "Landscape of Nation", the Basoeki Abdullah Museum, 2011)

This context is closely related to the personal experiences and skills of the individual painters. Some painters have expressed that mountains and rice fields are part of themselves, unrelated to the other contexts mentioned above. Ketut Susena powerfully employs technical skills involving drips and splashes of paint and color. Armed with an abstract expressionist style, Susena gave birth to the idea of erupting lava. Susena's gesture demonstrates the spirit and dynamism of nature born from his imagination.

Yon Indra uses his canvas as a medium to understand the formal aspects or language of nature. Susena and Indra enrich the treasury of landscape paintings featuring mountains and rice fields with a contemporary approach without abandoning academic foundations.

Aidi Yupri's work depicts a rice field as if composed of letters. Using crop circle-like formations, he emphasizes that nature is a field of lessons and signs.

5.0 Discussion

The curated selection of sixteen paintings in the "Landscape of Nation" exhibition offers a platform for public appreciation of environmental concerns, focusing on mountains. By exploring five contextual frameworks, the artists not only depict mountains or rice fields as agricultural lands but also imply a symbolic play of signs. From another perspective, the interpretation of mountains and rice fields extends to sociological, fantastical, and even Sufi (religious) dimensions, fostering a sense of human faith in the Creator.

Mountains and rice fields are the lifeblood of many people, including the painter Basoeki Abdullah. Without them, Basoeki Abdullah's artistic narrative might have been entirely different. His series of landscape paintings in the exhibition is part of his statement that he not only reveals the beauty of nature but also articulates the discourse of natural landscapes as a form of personal identity. Unintentionally, he has introduced the concept of a "nation of mountains and rice fields" through his paintings.

Other artists have served as continuous observers of mountains and rice fields. They frequently undertake documentary and critical explorations of society and nature. By incorporating mountains and rice fields into their artworks, these artists seek to express human values and imagery. Their works delve into various compelling issues, including documenting specific locations, natural phenomena such as volcanic eruptions, land transformations, the destructive impact of human activities on the environment, and critical reflections on Indonesia's future. These artists also engage in creative explorations of nature for spiritual and nationalist expression.

As a nation in a region prone to volcanic activity and natural disasters, we should exercise prudence and adaptability, refraining from imposing foreign development models. Indonesia is a nation of nature, not concrete. Our land requires trees, not steel-reinforced concrete. If we continue to replace tree roots with iron ones, we risk reducing our natural landscapes to mere images or paintings. Ultimately, Indonesia would be left with a series of impending disasters.

6.0 Conclusion and Recommendations

The curated paintings in the "Landscape of Nation" exhibition have proven to be a valuable tool for illuminating environmental issues. Mountains and rice paddies, as the primary subjects of these works, offer rich layers of meaning and significance. Through various contextualization, these paintings of mountains and rice fields have positively impacted Indonesian people. The exhibition serves as a reminder to the Indonesian archipelago's inhabitants to remain vigilant and adaptable.

Based on the diverse contexts in the curated collection of sixteen paintings, two recommendations can be made. Firstly, the Basoeki Abdullah Museum should be encouraged to organize more exhibitions with similar themes. This aligns with the overarching themes present in Basoeki Abdullah's own body of organized paintings with descriptive narratives, which would significantly enhance the viewers' appreciation for the symbolic significance of mountains and rice fields. Secondly, viewers should be encouraged to cultivate a deeper awareness of historical and contemporary perspectives. Paintings can serve as a means of aesthetic and ethical learning, allowing viewers to understand the thoughts of both past and present artists in their explorations of the cultural significance of mountains and rice fields.

Acknowledgement

The artists, the Basoeki Abdullah Museum, farmers, and mountain rangers.

Paper Contribution to Related Field of Study

Research on art and environmental issues makes significant contributions to the field of education, particularly in the humanities (relating to societal systems and daily life), art studies (concerning various genres, styles, and techniques in art), natural sciences (including geography, physics, biology, forestry, and agriculture), and museology (as well as curatorial studies that elevate the significance of exhibited objects within society).

References

Anggrian, Mayang; & Nur Iksan, 2022, "Seni dalam Dimensi Ekologi: Peran Insan Seni dalam Advokasi Isu Lingkungan", Jurnal *Brikolase* Online: https://jurnal.isi-ska.ac.id/index.php/brikolase/index, doi: 10.33153/brikolase. v13i1.3356

Baomar, Zainab Salim Aqil Alhadi; & Oman Reham Sanad, 2020, "A study of landscape painting development – Past, present and future perspectives", *Selected Paper of 9th World Conference on Design and Arts (WCDA 2020)* Nov 29 - Dec 1, National Kapodistrian University of Athens (ONLINE VIRTUAL CONFERENCE).

Bruce W. Ferguson, Sandy Nairne (ed.), *Thinking about Exhibitions* (London/New York: Routledge, 1996).

Hall et al., 1996 Hall, R., 1996. Reconstructing Cenozoic SE Asia. In: Hall, R., Blundell, D.J. (Eds.), Tectonic Evolution of SE Asia. Geological Society of London Special Publication 106, 153-184.

Mulyana, 1979, *Nagarakertagama dan Tafsir Sejarahnya*. Bhratara Karya Aksara, Jakarta.

Palma, Vittoria Di, "Is landscape painting?" in Gareth Doherty and Charles Waldheim (eds.), *Is Landscape...? Essays on the Identity of Landscape* (London: Routledge, 2016).

Susanto, M., 2024, *Menimbang Ruang, Menata Rupa*, Yogyakarta: Dicti Art Lab.

Susanto, M., 2018, *Diksi Rupa: Kumpulan Istilah dan Gerakan Seni Rupa*, Yogyakarta: Dicti Art Lab.

Thornes, John, 2008, "A Rough Guide to Environmental Art," December Annual Review of *Environment and Resources* 33 (1), DOI: 10.1146/annurev.energy.31.042605.134920.

Yulianto, E., Kusmayanto, F., Supriyatna, N., Dirhamsyah, M., 2010, "Where the first wave arrives in minutes: Indonesian lessons on surviving tsunamis near their sources," *IOC Brochure* 2010-4, 28 pp., U.N. Educ., Sci., and Cultural Organ., Paris.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Possibility to Implement the Usage of Plants as Coloring Agent for Hard Element

Charusiri Pasu[1], Irena Vanessa Gunawan[2]

[1] Silapkorn University, Department of Decorative arts, Bangkok, Thailand
[2] Universitas Kristen Maranatha, Arts and Design, Bandung, Indonesia

Email of All Authors: rprun@hotmail.com irenavg75@gmail.com
Tel: (+66)81 4455 285

Abstract
The creative industry is increasingly focused on extracting natural colors from plant materials, using methods like boiling, tinting, and soaking to apply color primarily to softer materials. However, these techniques are less effective for hard surfaces and often rely on toxic chemicals and unnatural processes. This research aims to investigate the potential of using raw materials from flowers, leaves, and plants as natural coloring agents for hard surface applications. The objective is to develop an effective and eco-friendly coloring process that promotes the use of natural dyes in hard surface coloring within the creative industry.

Keywords: Natural colors, Hard surface colorization, Raw properties of material

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/ebpj.v9iSI23.6169

1.0 Introduction

1.1 Use of a chemical coloring process in the hard surface materials and its effect

Hard surface materials play a crucial role in industrial settings due to their robustness, strength, and ability to withstand challenging conditions. These materials find applications across a wide range of industries and are commonly classified into categories such as metal, plastic, stone, ceramic, composite, and more. This research is particularly focused on exploring composite materials, with natural ways of coloring as a priority due to their intricate nature and importance in various industries. However, the issue of global warming has raised a significant amount of concern that force every industry to find ways to address this critical issue through various ways of sustainability effort.

The use of herbs and spice as coloring agent has been known from centuries, they are used to added elements of aesthetics to complement the basic function of food, cloths, or housewares. The way to use it is to extract the color into color pigments and implement it through boiling, soaking, paint or taint it. However, when pigment is derived from the plant's part, there will be a byproduct of the process than becomes a waste. The process of extracting itself also need the use of energy. Although this process is not as volatile as using chemical or synthetic coloring agent, it is still present as a problem nevertheless. Hence this research aimed to use the parts and

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/ebpj.v9iSI23.6169

used it as a body filler of the composite material as well, with the same principle for using wood dust as a body to form Medium Density Fibre Board (MDF) that is so commonly used in the construction nowadays.

Resins, particularly refers to a synthetic polymer, hold a prominent position as the material of choice in a wide range of products across various industries. Their significance lies in their exceptional versatility, durability, and adaptability, making them vital components in modern manufacturing processes. The utilization of resin spans across a multitude of industrial operations and applications, including coatings, adhesives, composite materials, plastics, polymers, construction projects, and the automotive sector. Undoubtedly, resin, in particular, has risen to prominence as a popular and multifaceted material within the realm of design. Its distinct attributes, such as enduring quality, transparency, and the capacity to take on diverse forms through casting, render it a highly sought-after medium for the creation of both utilitarian and artistic works.

To introduce color variations in resin materials, the common approach involves blending color pigments into the liquid resin before casting or applying surface dyes following the hardening stage. Both techniques rely on the inclusion of chemical color agents to attain the intended outcomes. While herbs and spices are items in the households, incorporating natural elements into designs is a well-established practice. Within the design field, the incorporation of herbs and spices is typically associated more with their sensory attributes, such as aroma and flavor, rather than emphasizing the distinctive visual traits they possess. For these reasons, the research will explore the ways to emphasize the distinctive characteristics and appearances of herbs and spices as key elements in the design process. By incorporating the unique textures, colors, and natural aesthetics of these materials, the research aims to create visually striking products that not only showcase the beauty of the herbs and spices themselves but also highlight their functional roles in the material accordingly.

1.2 Exploring, the possibility of reusing in-landed waste as a source of materials.

The concept of reuse, reduce, and recycle has been integrated into design industries for some time. Contemporary trends and social movements strongly emphasize environmentally friendly approaches, aligned with global Sustainable Development Goals (SDGs). To address climate change and environmental preservation, this research investigates the potential of industrial waste as a raw material for hard surface materials. Construction sites generate significant waste due to cutting and fitting processes, with MDF as a common example of a material developed to mitigate this issue. However, other waste materials, such as metal, aluminum and glass, have limited recycling options due to property degradation and complex processing requirements.

For these reasons, the research is focused on reusing raw waste materials from their original forms to create new materials. By repurposing these waste products at their initial stages, the study aims to transform what would typically be discarded into valuable resources. This approach not only reduces the environmental impact associated with waste disposal but also promotes a more sustainable cycle of material use. Ultimately, the goal is to develop new materials that align with sustainability objectives while minimizing waste and supporting environmental movement accordingly.

2.0 Literature Review

In this chapter, we define and discuss similar previous studies that were performed related to our study**.** For thousands of years herbs and spices has begun playing an essential role in human life either used for flavoring, preservation and coloring agent in food, medicine, cosmetics and others like painting, textile and various houseware. Being safe to be consumed by men, herbs and spices-based coloring becomes a preferable healthy and sustainable choice (Elizabeth, J., 2017) Mostly originate from Europe, Africa and Asian countries, spices and herbs are obtained from non-woody and flowering plants. Spices are obtained from the dry part of the plant like rootstalk, twigs, nuts, flower, seeds and outermost layers of stems and roots. Herbs are always obtained from the leaves (Farhana, et. all., 2021)

Herbs and spices also always regarded as a source of natural colors. Human has perfecting ways to derive color pigments and used them not only for food, or cosmetics but also for textile and various housewares by ways of dip, paint or taint. In a research conducted in India regarding staining capability of spices in Indian food turmeric is regarded the most capable in staining resin-based material (Usha, C, 2018). In several cases herbs and spices can provide not only coloring benefit but antibacterial properties at the same time like being shown in a research regarding the use of turmeric to dye silk fabric, where it also increases the anti-bacterial properties of the material (Ghoereishian, S., 2013) The same effort use in wood industry to more natural antibacterial by impregnating it into the wood, although the capabilities differ amongst different kind of wood (Peker H., 2021).

The common way to derived color in industry scale from herbs and spices is to extract it by chemical process, use heat or using fungi by biotechnology process resulting in what is called Monascus pigment. (Pintea A.,2008) More traditional way is by boiling the herbs and spices with resulted in colored water which is then used to boil or dip the intended material to be colored (Tresnawati, N., 2020) Other way is to transfer the color essence directly from herbs and spices to the material it is intended too, like in the process of eco-printing (Haylamaz, et all. 2023). However, the byproducts of herbs and spice industry becomes its own problem, as they are regarded as a waste (Shams, R., 2023). Only successful effort of utilizing and enhancing this by-product can, in the end, support the agricultural overall sectors sustainability. Several utilizing efforts for example by turning it into higher-value goods, which in turn creating new jobs that help local community prosper economically (Nair, et al., 2022). Therefore, it is the aim of this research to use the spice as a whole, not only for the coloring properties and leaving waste which becomes another environmental issue, but as a composite element to produce hard surface for furniture or interior benefit.

3.0 Methodology

3.1 Exploration of herb and spices colors

In the resin coloration, two predominant techniques have been practical in practice including: the integration of pigments directly into the liquid resin pre-casting and the application of dyes onto the solidified surface post-casting. Both methodologies have relied heavily on chemical colorants to achieve specific shades, color tones and hues. However, in a recent experiment process, the studies explore the potential substitute methods to replace these chemical colorants with the naturally occurring pigments found within the bodies of various herbs and spices. This exploration aimed to not only diversify the color palette available in resin production but also to potentially introduce a more sustainable and environmentally friendly approach to resin coloring. The research, focused on a meticulous process by selecting primary colors derived from natural materials as the focal points for preliminary testing subjects within the experiment. Each color was meticulously selected to showcase the distinct hues found in various organic sources: red from grounded dried red chili, green from grounded dried green chili, yellow from turmeric, light brown from curry powder, and dark brown from ground coffee beans. At the outset of this innovative experiment, the research strategically combined these selected natural materials into the adhesive liquid in varying ratios. This deliberate approach aimed to explore a spectrum of ingredient proportions to discern their impact on the final color outcomes. By systematically balance the ratios of these primary colors within the adhesive mixture, the researchers sought to contribute the visual aesthetics of the hardened surface material. This methodical exploration set the groundwork for an understanding of how each natural pigment influenced the overall color palette and characteristics of the adhesive product, setting the stage for further exploration and refinement as shown in Fig. 1.

Fig. 1: The image of selected herbs and spices mixing with adhesive experiment results
(Source:) The authors

3.2 Exploration on in-landed waste

The primary objective of this research was to provide alternative color solutions for the coloration process in hard surface materials while focusing the area of studies beyond conventional natural products. This initiative aims to expand the potential for reusing waste materials in the production process without compromising the integrity of the original resources. In other words, the research strives to harness waste to create new materials while emphasizing minimal energy consumption throughout the process. When considering the unique properties of glass, it becomes evident that it stands apart from other materials. One of the key challenges associated with glass is that once it breaks, it becomes exceedingly difficult to regenerate or reproduce in its solid form. To return glass to a liquid state for reshaping and repurposing into desired products, it must be subjected to extremely high temperatures. This requirement for significant energy input poses a challenge for recycling efforts, as the energy-intensive nature of melting glass limits the feasibility of its regeneration.

Focusing on the waste generated from the metal industries, it becomes clear that metal scrap and shavings undergo similar recycling methods. The recycling process requires exposure to high temperatures to convert the materials back into a liquid state, making them able to reproduction and reforming. Metals, particularly aluminum, are known for their weatherproof characteristics, durability, and long lifespan, making them a top choice in construction and manufacturing process. However, the cutting or division of aluminum materials often results in the creation of shavings and scraps that are challenging to repurpose or reform into new products. These fragments can pose a significant challenge within the recycling industry, as their irregular shapes and sizes complicate the recycling process. Recognizing this issue, the research team identified a valuable opportunity to utilize these metal shavings and scraps in an innovative way beside their traditional recycling processes. By exploring alternative applications for repurpose the use of scrap and shred materials, the research seeks to maximize resource efficiency and reduce waste, ultimately contributing to more sustainable practices within the metal industry. This approach not only addresses the challenges presented by metal waste but also provided new possibilities for integrating these materials into diverse applications, thereby promoting a circular economy, respectively.

The experiment combined these selected waste materials into the adhesive liquid using different ratios to explore the effects on texture, and overall appearance of the final output, as shown in Fig.2.

Fig. 2: The image of selected industrial toxic waste mixing with adhesive experiment results
(Source:) The authors

4.0 Findings

4.1 The exploration of alternative options for coloring hard material products

This study, presents a fascinating avenue for innovation, particularly through the implementation of herbs, spices, and even industrial toxic waste. This approach not only aims to diversify the color palette available for various applications but also seeks to promote sustainability and environmental responsibility in the manufacturing process. In addition, the potential to incorporate industrial toxic waste into the coloring process opens up an intriguing dialogue regarding waste reuse and resource efficiency. While the term "toxic waste" typically carries negative connotations, with the right processing and treatment, certain by-products from industrial activities could be transformed into functional pigments or colorants. The possibility of combining natural and industrial waste materials in the coloring of hard products can lead to a more sustainable and responsible approach to manufacturing respectively.

4.2 Possibility to provide substitution of colors pigment in hard surface materials.

The issue of potential chemical waste is predominantly present within the realm of synthetic color pigment production. The creation of these synthetic pigments involved a chemical process that can result in the generation of byproducts and residues. If not handled and disposed of in a proper manner, this issue undoubtedly poses a significant harm to the environment. In the event of their release into the surrounding environment directly effects ecological consequences. Among the various aspects of the production process, the wastewater produced stands out as a particularly critical concern associated with synthetic coloring methods. When toxic waste materials are collected and repurposed, they can be transformed into new products or incorporated into existing materials, thus keeping them out of landfills and preventing their harmful components from leaching into the soil.

4.3 Providing the alternative natural colors options

Throughout history, herbs and spices have served as a veritable treasure trove of natural colors, finding diverse applications spanning from culinary endeavors to textile dyeing. Offering a sustainable and aesthetically pleasing alternative to synthetic dyes, these botanical sources contribute a rich and varied palette of hues. The colors derived from natural sources often exhibit a more subdued or earthy quality, contrasting with the bold and vivid tones achievable through synthetic pigments. While certain natural pigments may manifest in an opaque form, many showcase a translucent nature. This transparency lends itself to the creation of intricate layering effects, resulting in visually captivating outcomes. As exemplified by the blend of turmeric, calcium and metal shred depicted in Image Fig.3., the interplay of natural pigments not only offers a nuanced color spectrum but also opens avenues for artistic exploration and creativity. In the realm of pigments, a notable distinction often arises between natural and synthetic variants in terms of particle size. Natural pigments tend to exhibit larger particle sizes compared to their synthetic counterparts, a factor that can significantly influence both the intensity of coloration and the overall texture of the end product. This characteristic difference in particle size not only influences the aesthetic appeal of the pigments but also contributes to the distinctive visual effects they achieve in various applications respectively.

In this research, the focus on alternative coloration methods seeks to address these challenges by exploring the utilization of waste materials, not only to create vibrant colors but also to contribute to a more sustainable approach in the production and reuse of hard

surface materials, including glass and metal scrap and metal shred. By investigating innovative solutions and strategies, the research aims to promote a circular economy that values resource efficiency and minimizes environmental impact respectively.

Fig. 3: The image Turmeric, Calcium and Metal layering experiment results
(Source:) The authors

5.0 Discussion

5.1 Exploring the potential utilization of herbs and spices on hard surface materials represents a promising frontier with a multitude of possibilities.

Incorporating these natural elements into hard surface materials opens avenues for innovation and creativity, offering a departure from conventional synthetic additives. The application of herbs and spices on hard surfaces presents a range of advantages. These natural ingredients bring with them not only their inherent color properties but also their unique textures. Furthermore, the prospective use of herbs and spices on hard surfaces aligns with the growing demand for sustainable and eco-friendly practices in various industries. By opting for natural additives, stakeholders can reduce their reliance on synthetic chemicals and contribute to a more environmentally conscious approach to material production. Overall, exploring the incorporation of herbs and spices into hard surface materials represents a harmonious blend of nature-inspired design, sensory stimulation, and sustainable innovation, paving the way for a more vibrant and environmentally friendly aesthetic in diverse applications accordingly.

5.2 Possibility to equip the natural materials agents in adhesive process.

By considering the incorporation of these organic elements into adhesives, a new frontier emerges in the realm of bonding techniques, offering a departure from traditional synthetic formulations. The exploration of natural materials as agents in adhesive processes holds significant promise for various applications. These natural ingredients bring forth a range of unique properties, including biodegradability, sustainability, and potentially enhanced adhesive qualities. By harnessing the inherent characteristics of natural materials, such as plant extracts or mineral derivatives, in adhesive formulations, manufacturers and researchers can potentially unlock novel solutions that cater to eco-conscious consumers and industries. Embracing natural additives not only diversifies the range of available resources but also contributes to reducing the environmental footprint associated with adhesive production and application. In conclusion, exploring the feasibility of incorporating natural materials as agents in adhesive processes represents a dynamic convergence of sustainability, innovation, and performance enhancement, opening doors to a more ecologically harmonious and technologically advanced adhesive respectively.

5.3 Limitation of materials properties

Achieving the liquefaction of adhesive materials necessitates the application of specific temperature thresholds to facilitate the mixing process effectively. In the context of resin materials, for instance, a temperature range of 43-70 degrees Celsius is commonly prescribed to achieve the desired state of fluidity during the blending phase. In a targeted approach towards integrating grounded natural material sources for pigmentation, the focus lies on leveraging green-leaf powder and flower petal powder as key additives.

The outcomes of the experimental undertaking revealed intriguing results, indicating a transformation in color from the initial blend to the hardened state of the material. Specifically, the incorporation of green-leaf powder and flower petal powder led to the development of rich, dark brown hues upon the completion of the hardening process. An important consideration in working with natural materials is the challenge of preserving the exact finishing colors throughout production. Given the dynamic nature of plant and mineral pigments, achieving consistent color outcomes can be a formidable task. During the mixing phase where temperatures are elevated, a noteworthy

phenomenon emerges in the form of small air bubbles being released from the color pigment agents as the materials blend together. This occurrence is influenced by the fluctuation of temperatures throughout the adhesive preparation process, particularly during the subsequent curing and hardening stages where temperatures decrease. This purging of air bubbles is a critical aspect of ensuring the integrity and quality of the final adhesive product, as the presence of bubbles can compromise the structural integrity and visual appeal of the hardened material. The synthetic nature of artificial pigments may result in variations in how they interact with temperature fluctuations during the mixing, curing, and hardening processes. Understanding and managing these distinct characteristics of natural and artificial pigment agents play a pivotal role in achieving desired outcomes in adhesive formulation and application.

Fig. 4: The results of herbs, spices and waste materials colorize in hard-surface experiments
(Source:) The authors

6.0 Conclusion & Recommendations

6.1 Future work

The study purpose was to investigate the colorization in hard surface material. The results of this research indicated the possibilities to implement natural color pigments from natural resource directly into the body of materials, creating new colors palette for the design industrials as shown in Fig.4. On the process of experimental procedure, this research discovered an alternative option of a color in material by added aluminum dust and glass bits into body of adhesive materials on mixing process. The study results and significant findings have provided valuable data, leading to greater in-depth understanding of the way to involved raw material into the hard-surface materials for product design respectively.

6.2 The use of new materials

The findings from this research indicate the exciting possibility of reusing raw materials to create new, functional products. Looking ahead, the research team plans to expand the application of these newly colorized hard surface materials for larger-scale industrial purposes. A primary focus of future efforts will be on transforming glass shards into panels that can serve as valuable resources in the construction industry. Additionally, the team believes there is significant potential in repurposing aluminum shavings and scraps. By utilizing these aluminum shreds, it may be possible to develop aluminum panels that could serve as an alternative to traditional aluminum sheets. Much like medium-density fiberboard (MDF), recycled aluminum panels could offer a comparable option, providing the same durable and versatile qualities for various applications. The research aims to showcase the viability of utilizing waste materials to create innovative products that meet industry standards, thereby promoting practices across industries respectively.

References

Farhana, et. all., 2021, “Herbs and Spices: New Processing Technologies”, edited by Rabia Shabir Ahmad. Intech Open Publishing, London, England. online ISBN 978-1-83969-609-1

Jessica Elizabeth DLT, Gassara F, Kouassi Ap, Brar SK, Belkacemi K., 2017, “Spice use in food: Properties and benefits” Critical Reviews in Food Science and Nutrition. 2017; 57 (6):1078-1088.

Ghoreishian, S.M., Maleknia L., Mirzapour H., Norouzi M., 2013 “Antibacterial Properties and Color Fastness of Silk Fabric Dyed with Turmeric Extract.” Fibers Plum 14, 201-207 (2013), https://doi.org/10.1007/s12221-013-0201-9

Haylamaz et. all, 2023 “Reuse of Waste Clothes with Eco Print Method”. 1st International Congress and Exhibition on Sustainability in Music, Art, Textile and Fashion (ICESMATF 2023) pp 106 - 114.

Nair, L. G., Agrawal, K., & Verma, P., 2022. “An Overview of Sustainable Approaches for Bioenergy Production from Argo-Industrial Waste. Energy Nexus, ^, 100086

Peker H., Ulusoy H., 2021 "Evaluation of the Extract Obtained from Various Medicinal and Aromatic plants "Antibacterial and Antioxidant" in the Wood Industry. International Journal of Secondary Metabolite, Vol 8, No. 2, 113-119. https://dx.doi.org/10.21448/ijsm.891498

Collado, S., & Corraliza, J., A. (2017). Children's Perceived Restoration and Pro-Environmental Beliefs. *Journal of ASIAN Behavioral Studies, 2*(2), 1-12.

Pintea A.,2008 'Food Colorants Derived from Natural Sources by Processing' *Food Colorants: Chemical and Functional Properties*. CRC Press. London, New York.

Shams R., 2023. "By-Products of Plantation Crops and Spices: Utilization and Value Addition' *Recent Advances in Spices, Herbs and Plantation Crops*. Lovely Professional University. ISBN 978-81-19334-76-6

Tresnawati N., et. all, 2020 "The Utilization of Local Plants as Natural Dye Ciwaringin Batik, Cirebon, Indonesia". EurAsian Journal of BioSciences Vol 14, Issue 2 pg. 7357-7364

Usha, C., Rao, S., George, G., 2018, "A Comparative Evaluation of the Staining Capacity of Microhybrid and Nano hybrid Resin-Based Composite to Indian Spices and Food Colorant". Indian Journal of Dental Research 29 (2): p 201-2015, Mar- Apr 2018. DOI: 10.4103/ijdr.IJDR_764_16

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Confronting Drug Issues at Kelantan-Thailand Border: In-depth inquiry from internal and external stakeholders

Siti Zulaikha Mustapha[1], Yarina Ahmad[2*], Nur Amalina Aziz[3], Amanda Balqis Mohd Mazalan[4], Umi Nurul Najihah Azman[4], Nor Azira Ayob[5], Nor Suziwana Tahir[4]

[*] *Corresponding author*

[1] Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA, Kelantan, Malaysia
[2] Institute for Biodiversity and Sustainable Development (IBSD), Universiti Teknologi MARA, Selangor, Malaysia
[3] Faculty of Business and Management, Universiti Teknologi MARA, Johor, Malaysia
[4] Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA, Selangor, Malaysia
[5] Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA, Negeri Sembilan, Malaysia

szulaikha@uitm.edu.my, yarina@uitm.edu.my, amalinaaziz@uitm.edu.my, amandamzln7@gmail.com, unnajieha5@gmail.com, norazira@uitm.edu.my, suziwana@uitm.edu.my
Tel: 013-4462149

Abstract
Drug issues are a long-standing problem that has significantly impacted all countries in the world. The aim of this paper is to explore the drug issues involving the dyad stakeholders who deal with the drug issues in Kelantan-Thailand borders —enforcement agencies and community leaders. The findings indicate that drug issues in Kelantan-Thailand borders are serious. Among the internal challenges faced, including enforcement measures; lack of capacity; and integrity issues. The external challenges include geographical and cultural challenges; community awareness, participation, and engagement; and legal measures. Thus, to effectively combat the severity of drug issues in Kelantan and Malaysia, particularly, it is crucial to continually strengthen the roles and responsibilities of both enforcement agencies and the community.

Keywords: Drug issue; Kelantan-Thailand border; enforcement agency; community

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6351

1.0 Introduction

The global drug crisis continues to harm people around the world, with the number of drug users increasing by 23% over the last decade, from 240 million in 2011 to 296 million in 2021 (UNODC, 2023). This alarming growth coincides with an increase in drug-related crimes in a number of countries, including Malaysia. Despite concerted efforts by local and international authorities, the problem persists and grows in complexity. Drug-related challenges, such as use, abuse, addiction, production, trafficking, smuggling, and transit, have far-reaching consequences, particularly in Malaysia. The country's strategic location near the Golden Triangle, as well as its shared border with Thailand, have made it a key transit hub for drug smuggling, trafficking, and other illegal activities.

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6351

This paper emphasises on the investigation of drug-related issues in Malaysia particularly focusing on the Kelantan-Thailand border. This location has become a major conduit for illegal activities such as drug trafficking and other transnational crimes, including human trafficking and smuggling in Malaysia. The paper argued that in addressing these issues a comprehensive approach that includes both internal and external stakeholders, such as law enforcement and local communities are required.

2.0 Literature Review

2.1 Overview of Drug Issue

Malaysia is appealing to drug smugglers because of its proximity to Myanmar, Laos, and Vietnam (National Anti-Drug Agency, 2020). Thus, drug smugglers and traffickers employ a variety of strategies to avoid detection at checkpoints on all land, sea, and air borders into Malaysia, complicating the drug trade. Malaysia has open borders and drug trafficking routes, making it a regional drug hub. This led to organized crime, corruption, drug abuse, and addiction throughout the country. According to NADA statistics, the number of drug addicts in Malaysia is increasing. The NADA estimated that over 50,000 people would use drugs in 2020, with the majority being between the ages of 18 and 39. Mustapha et al. (2019) demonstrate that drug abuse leads to increased crime, family dysfunction, and mental illness.

2.2 Kelantan-Thailand Border

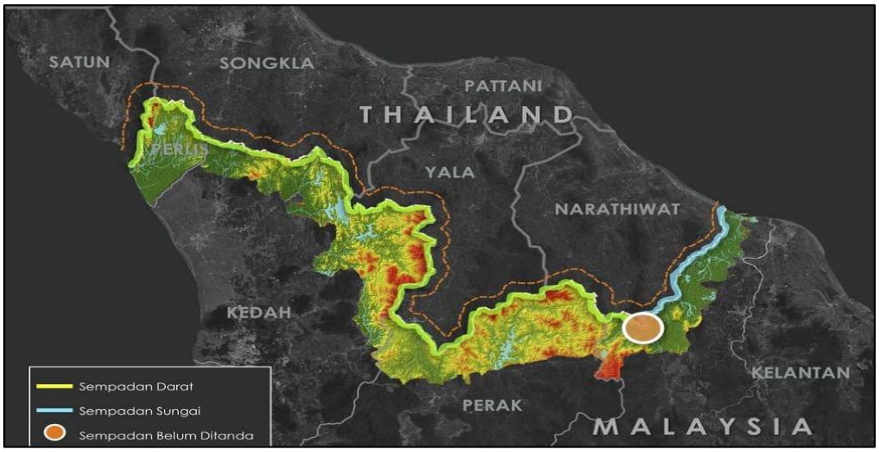


Fig. 1: Kelantan-Thailand Border
(Malaysia – Thailand International Border Study, 2021)

Kelantan is located in northeastern Malaysia and is bordered by Thailand's Sungai Kolok Province to the north, Terengganu to the south-east, Perak to the west, and Pahang to the south, as well as the South China Sea to the northeast. Bukit Bunga, Rantau Panjang, and Pengkalan Kubur are some of the areas that border Narathiwatt-Thailand (Lord and Tangtrongita, 2016). The Kelantan-Thailand border has long been a hotspot for drug trafficking, with both countries struggling to stem the flow of illegal substances (Mohamad Yasid, 2017).

2.3 Roles of Enforcement Agencies at the Border Entrance

In Malaysia, several agencies are in charge of managing Malaysian borders at 138 authorised checkpoints, including air, sea, and land. To manage the border's broad scope and complexities, different agencies have been assigned relevant roles based on jurisdiction (Zainol et al., 2019). For example, the Royal Malaysia Police (RMP), the Malaysian Maritime Enforcement Agency (MMEA), the Royal Malaysian Customs Department (RMCD), and the Malaysian Immigration Department (IMI) were in charge of managing any illegal routes along Malaysia's border, particularly those via land, air, and sea.

2.4 Issues and Challenges in Enforcement

While efforts have been made to combat drug use in Malaysia, several challenges remain. According to Ross (2022), integrity issues among enforcement agencies, also known as 'enemy in blanket,' were widespread throughout the country, including Malaysia. Notably, corruption and bribery within law enforcement agencies have been identified as major barriers to integrity, allowing criminals to avoid capture and prosecution (Ross, 2022). Until today, many Malaysian law enforcement agencies have struggled with limited resources and assets, inadequate practises and training, and outdated technologies, limiting their effectiveness in combating modern-day crimes (Dollah et al., 2016). Notably, a lack of capacity and manpower among law enforcement agencies has resulted in increased ineffectiveness, particularly in combating the country's drug problem.

2.5 Roles of Community Leaders and Society

Local community involvement is an important yet often overlooked strategy for combating drug trafficking, distribution, abuse, and addiction. Cross-border communities may help to reduce drug-related crimes and societal challenges (Asian Development Bank, 2020). Individuals, families, communities, and society must recognise the risks of drug abuse, smuggling, and trafficking in order to effectively address drug-related issues. The bottom-up approach of communities to drug concerns is advantageous, creating a positive ripple effect across the country (Megat Ahmad, 2022; Isham & Yusof, 2020). Preventing and reporting drug-related activities can help families, community leaders, and law enforcement agencies reduce drug use in the country (Urus Setia Darul Aman, 2024; National Security Council, 2024).

3.0 Methodology

This study used a qualitative approach through in-depth interviews and focus group discussions. This method effectively addresses individual interpretations of informants' experiences (Ahmad et al., 2021), allowing informants to articulate their perspectives on drug-related issues, particularly along the Kelantan-Thailand border. Next is, a total of 15 samples representing dyads: internal (enforcement officers) and external (community leaders) stakeholders were involved in this study. Two focus group discussions (FGDs) were held among 12 enforcement officers at the land and sea border entrances between Kelantan and Thailand, involving the Royal Malaysia Police (RMP), Malaysia Maritime Enforcement Agency (MMEA), Malaysia Immigration Department (IMI), National Security Council (NSC), Malaysia Armed Forces (MAF), Malaysia Quarantine and Inspection Services (MAQIS), National Anti-Drug Agency (NADA), and other drug-related agencies. Besides, this study also included three community leaders from border areas. The informants were chosen based on their experience and knowledge dealing with drug problems and other crimes at border crossings. Finally, the data were analysed by using thematic analysis and managed by NVivo software.

4.0 Findings

4.1 The Seriousness of Drug Issues

Most of the informants involved in this study, who were either enforcement officers or community leaders, agreed that Kelantan, like other Malaysian states, has a serious drug issue, especially in the rural areas.

> *"When it comes to drugs, Kelantan had a serious problem. Many young people were involved with drugs." (M3, Community Leader)*

The main reason for the high prevalence of drug abuse in Kelantan is due to its geographical location, which is close to the Thailand border. According to the enforcement agency, the drug smuggling activities from Thailand to Malaysia are serious due to the high demands.

> *"In Kelantan, the majority of drugs are imported from Thailand and sold throughout the country." (FGD2, MAQIS)*

4.2 Internal Challenges

In terms of internal challenges, three main aspects were highlighted by the informants who were involved in this study. The first challenge is in terms of enforcement measures undertaken by the relevant authorities. During the focused group discussions, the enforcement agencies shared almost the same feedback regarding the measures undertaken to address the drug issues. Among them are routine monitoring and surveillance at the entrance border, integrated operations, roadblock operations, and many others.

> *"The authorities carry out a variety of operations in addition to border enforcement and national border monitoring. Additionally, the authorities have established roadblocks (SJR) throughout Kelantan, including Gua Musang, Pasir Puteh, Kuala Krai, Jeli, and other locations. When these roadblocks are implemented, we can effectively combat ketum smuggling. Ketum-related arrests occur roughly twice a month." (FGD1, RMP*)

Despite the various efforts made by the relevant authorities, drug issues remain a challenge for the country. This is due to the rapidly evolving global challenges such as advanced tactics used by the criminals, the usage of technological tools to facilitate criminal activities, easy access and communication, and syndicates that have local people and enforcement officers as masterminds.

> "*In my opinion, enforcement at the Kelantan-Thailand border was carried out as effectively as possible. However, leaks continue to occur, and cross-border crime continues to increase." (M1, Community Leader)*

The second internal challenge is related to a lack of capacity. Based on the feedback from the enforcement agencies, Malaysia's defences assets are still lacking in comparison to those of its neighbouring countries, including Indonesia, Thailand, and Singapore. Almost all enforcement agencies that deal with drug issues in Malaysia emphasised this aspect. For instance, the closed-circuit television

(CCTV) surveillance system at the Kelantan-Thailand border is more advanced than Malaysia's CCTV system. The enforcement officer also highlighted other assets, such as scanners used at the border entrance and other facilities (transportation, vehicles, and others).

> *"In my opinion, national security assets must be compatible with the country's development. Many foreign countries, including Indonesia, Thailand, and Singapore, priorities the development of their own defence assets. However, Malaysia continues to lag behind in terms of national defence assets." (FGD1, MMEA)*

Finally, the third internal challenge discovered in this study is related to the integrity issues. Corruption is the most common integrity issue encountered when dealing with drug issues. Community leaders agreed that many corruption activities happened at the border entrance.

> *"Corruption exists. Corruption can jeopardise national security. In the context of enforcement officer corruption, it is like the proverb 'fencing erected to protect the rice field turns around and devours the rice'." (M1, Community Leader)*

The misuse of power is another integrity issue highlighted by community leaders. This was particularly noticeable at the Rantau Panjang border. There are many people from Thailand who are using small boats to cross the border. This situation is considered common in that area. In fact, it is argued that the enforcement officers in that area are aware of the smuggling activities.

> *"At the Kelantan border, it is easy to enter and exit using just a boat, and a lot of smuggling occurs because there are 'connections'." (M2, Community Leader)*

The community leaders also highlighted a lack of integrity among the enforcement officers during the monitoring and surveillance at the border entrance. For example, the enforcement officers' familiarity with the local vehicles prevents them from conducting thorough checks. Due to this situation, any smuggling activities carried out by the local people will remain undetected. This is also another integrity issue that is related to a lack of responsibilities during performing their tasks.

> *"Drug smuggling at the country's border may occur in various forms. For example, the border performs vehicle inspections only on vehicles that infrequently enter the area but rarely on vehicles that frequently use that route. Typically, smuggling involves local vehicles that frequently enter and exit the area. Furthermore, drug smuggling becomes easier when smugglers are familiar with the authorities and law enforcement officers along the route." (M2, Community Leader)*

Nevertheless, the community leaders agreed that the integrity issues associated with the enforcement officers only represent themselves, not the agencies.

4.3 External Challenges

In terms of external challenges, three main themes emerged from this study's findings. Geographical and cultural aspects are the first external challenges. Kelantan state shares a land border with Thailand. In addition, the Rantau Panjang and Thailand border is only separated by a river called "Sungai Golok." This geographical location posed a major challenge for the enforcement authorities to address any smuggling and border crime issues. According to the community leaders, people from Thailand continued to cross the border with a small boat during the pandemic COVID-19, even while the Movement Control Order (MCO) was in effect. They did not use the engine boat to avoid being discovered by the enforcement officers. This shows how easy it is for the people in Thailand to cross to Rantau Panjang.

In addition, people at the Kelantan-Thailand border shared almost the same culture. Given that many of them have familial ties to each other, this can be attributed to their shared historical background. Many people who live along the border with Kelantan are married to Siamese people in Thailand. As a result, some of their children attended school in Kelantan, and vice versa. They can easily transport any goods from Malaysia into Thailand, as well as outside of Thailand.

> *"Kelantan has three designated routes: Bukit Bunga, Rantau Panjang, and Pengkalan Kubor. However, breaches can occur in numerous areas. For example, in Rantau Panjang, many students cross over to attend school. Some students travel to Siam (Thailand) to attend schools there. Perhaps we need to build a fence or barrier to stop this entry." (FGD1, RMP)*

The second external challenge is related to community awareness, participation, and engagement. While acknowledging the prevalence of drug issues in Kelantan, community leaders asserted that addressing this issue is challenging due to a lack of cooperation

within society. Many members of society have not taken action to report the drug abuse issue. However, they will notify the authorities right away if they encounter any criminal activities committed by drug addicts in their community.

> *"Drug issues are difficult to control. This is due to the local community's refusal to cooperate and slowness in reporting drug addiction. Residents only take action when other crimes occur, such as theft (of gas cylinders and others) committed by drug addicts." (M2, Community Leader)*

Notably, the findings of this study uncovered that almost all community leaders stated that addressing the drug issues is the responsibility of the enforcement agencies. This finding clearly shows that there is a lack of community participation and engagement to address the drug-related issues in their areas.

> *"If we talk about the issue of drugs in Kelantan, it can be said to be serious. However, we have no control over the drug issue; it is controlled by law and police enforcement." (M3, Community Leader)*

Finally, the third external challenge is in terms of the legal measures, particularly in dealing with the ketum leaves issue. In Malaysia, ketum leaves are allowed to be harvested but not allowed to be sold. However, previously, Thailand prohibited the harvesting of ketum leaves, despite their widespread use. Recently, the Thai government has permitted the harvesting of ketum leaves for medicinal purposes. Despite this, Thailand's high demand for Ketum leaves led to the purchase of Malaysian-harvested leaves.

> *"The issue of ketum leaves has still to be resolved. This is because, in Malaysia, ketum leaves can be grown but not sold. In contrast, Thailand permits the cultivation and sale of ketum leaves. This legal difference complicates enforcement." (M2, Chinese, Community Leader)*

5.0 Discussion and Conclusion

This study revealed the seriousness of drug issues (abuse, smuggling, trafficking, and others) near the Kelantan-Thailand border, particularly in rural areas. This issue, particularly related to drug abuse among younger generations, has resulted in high unemployment and an increase in crime cases involving drug addicts as criminals. One of the main factors contributing to high rates of drug abuse, smuggling, and trafficking is its geographical location, which allows people from Thailand to easily enter and vice versa. Kelantan is now known as a "hub" for drug trafficking and distribution. Nearly every Kelantan community has reported drug abuse cases (Berta Harian, 2019).

While agreeing that relevant agencies have taken necessary actions to address drug issues in Kelantan, it is argued that the current measures are ineffective (Mohamad Isa, 2022). This situation is influenced by limited capacity and resources, such as defence assets, manpower, facilities, and officer skill gaps (Dollah et al., 2016). Furthermore, integrity issues were one of the most significant barriers to addressing the drug problem in Kelantan. Corruption and abuse of power are among the most common integrity issues involving law enforcement agencies (Ross, 2022). Furthermore, corruption within enforcement agencies endangers national security (Saad, 2013). Community awareness, participation, and engagement continue to be major challenges in addressing the drug problem holistically. Notably, all community leaders who participated in this study stated that addressing the drug problem is the responsibility of law enforcement agencies, particularly the Royal Malaysia Police. Relying solely on government agencies will not help solve the drug problem. The community must play a role in assisting the agencies by filing reports on drug abuse issues, conducting programs and activities to raise community awareness, and encouraging further participation in the "war against drugs." This is critical because community empowerment helps members understand and accept the messages conveyed by programs and initiatives, particularly those aimed at drug prevention (Nwagu et al., 2020).

In conclusion, this paper has demonstrated that drugs continue to pose a significant threat, and a thorough understanding of the underlying causes at the local, national, and international levels is required. It is critical to recognise that drug problems stem from flaws in various systems, ranging from the individual to the global level. Further study involving other perspectives and focusing on other locations is required to understand the trend and root cause of the issues in Malaysia.

Acknowledgement

We wish to acknowledge the Universiti Teknologi MARA (UiTM), for the financial support through a research grant MYRA Social Science [File No: 600-RMC/GPM SS 5/3 (081/2021) to conduct this research.

Paper Contribution to Related Field of Study

This paper contributes to a better understanding of drug issues (abuse, trafficking, and smuggling) in Kelantan state, as well as the internal and external challenges of addressing the issue holistically.

References

Agensi Anti-Dadah Kebangsaan. (2020). Isu penyeludupan dadah di Malaysia. Retrieved from; https://www.adk.gov.my/

Ahmad, Y., Abd Hamid, S. N. F., Tahir, N. S., Ahmad, J., Aziz, N. A., & Mustapha, S. Z. (2021). Social construction and identity formation of 'street children' in the Malaysian context. Journal of Engineering Science and Technology, Special Issue on IAC2021, 46-61

Asian Development Bank (2020). Strengthening cross-border community collaboration in the CAREC region. A scoping study. Retrieved from https://www.adb.org/sites/default/files/publication/662071/cross-border[1]community-collaboration-carec.pdf on 29 June 2024.

Berita Harian (2019, 5 May). Eksklusif: Penagih di setiap kampung. Berita Harian. Retrieved from https://www.bharian.com.my/berita/kes/2019/05/560440/eksklusif-penagih-di-setiap-kampung, on 8 June 2021.

Berita Harian (2019, May 6). Eksklusif: Lebih 400,000 terdedah dadah. Berita Harian. Retrieved from https://www.bharian.com.my/berita/kes/2019/05/560749/eksklusif-lebih-400000-terdedah-dadah, on 8 June 2021.

Isham, M. I., & Yusoff, N. H. (2020). Komuniti sebagai agen kawalan sosial tidak formal dalam menangani masalah sosial (Community as an informal social control agent in handling social issues). Journal of Social Science and Humanities, 17(6), 80-92. ISSN: 1823-884x.
Lowe, T. (2021). What is community? Medium. Retrieved September 29, 2024, from https://medium.com/centre-for-public-impact/what-is-community-2e895219a205.

Lord, Montague J. & Tangtrongjita, Pawat, (2014). "Special Border Economic Zone (SBEZ) in the IndonesiaMalaysia-Thailand Growth Triangle (IMT-GT)," MPRA Paper 61060, University Library of Munich, Germany. Retrieved from https://ideas.repec.org/p/pra/mprapa/61060.html on 9 June 2021.

Malaysia – Thailand International Border Study (2022, May 17). Retrieved from; https://www.humanitariancap.com/projects/malaysia-thailand-international-border-study/

Megat Ahmad, P. H., Md Nawi, N. H., Ibrahim, H., Ayub, N. & Abdul Alim, A. Z., (2022). Kesedaran komuniti terhadap penyalahgunaan dadah di Sabah: Pemberdayaan komuniti: Community awareness on drug abuse in Sabah: Community empowerment. Jurnal Kinabalu, 28, 250–265. https://doi.org/10.51200/ejk.v28i1.2853.National Anti-Drugs Agency (2020). Drugs Statistics. Retrieved from https://www.adk.gov.my/en/public/drugs[1]statistics/ on 9 June 2021.

Mohamad Yasid, (2017). Ketagihan candu di tanah melayu sehingga tahun 1957. Journal of History Department, 30(1), 128-142. ISSN 1985-0611.

Muhammad Isa, (2022). The History, Modus Operandi and Challenges of Combating Drug Smuggling at Langkawi Island with Its Links to the Golden Triangle. Journal of Islamic, Social, Economics and Development, 7(45), 273-299.

Mustapha S Z, Mohamed Harith N H, Tuan Ismail T N. (2019). Issues and challenges in implementing drug treatment and rehabilitation programme at cure & care 1Malaysia (C&C1M) clinic from female providers' perspective. Int J Stud Child Women Elderly Disabl People; 6:43-50.

National Security Council. (2024, February 14). Peranan rakyat dalam memastikan masalah dadah dapat ditangani bersama. https://www.mkn.gov.my/web/ms/2024/02/14/peranan-rakyat-dalam-memastikan-masalah-dadah-dapat-ditangani-bersama/.

Nwagu, E. N., Dibia, S. I. C., & Odo, A. N. (2020). Community readiness for drug abuse prevention in two rural communities in Enugu State, Nigeria. SAGE Open Nursing, 6. https://doi.org/10.1177/2377960820963758.

Dollah, R., & Suharani, M. Z. (2016). "Fungsi dan Peranan ESSCOM dalam Menjamin Keselamatan Sabah: Satu perbandingan Persepsi antar Komuniti 'Luar' dan Komuniti ESSZONE" [Role & Function of ESSCOM in securing Sabah: A Comparative perspective between Outside community and ESSZONE Community], Jurnal Komunikasi Borneo [Borneo Communications Journal], 2, 1-28

Ross, C. (2022). Retrieved from; Losangeles.china-Consulate.gov.cn. http://losangeles.chinaconsulate.gov.cn/eng/topnews/202306/t20230628_11104750.htm.China Drug Situation Report.

Saad, S. A. (2013). 'Kenyataan polis Thailand mudahkan Malaysia perangi dadah sintetik'. Berita Harian. Retrieved from; https://www.bharian.com.my/berita/nasional/2023/05/1098252/kenyataan-polis-thailand-mudahkan-malaysia-perangi-dadah-sintetik.

Urus Setia Penerangan Darul Aman. (2024). Masyarakat bertanggungjawab membanteras dadah dalam komuniti. Retrieved September 29, 2024, from https://www.upda.my/

United Nations Office on Drugs and Crime. (2023). World drug report 2023: Executive summary [PDF]. https://www.unodc.org/res/WDR-2023/WDR23_Exsum_fin_SP.pdf

Zainol, N. A. M., Jusop, A. Z., Ridzuan, A. A., & Kamaruddin, S. (2019). Managing Malaysian border: The challenges and prospects in maintaining security. International Journal of Politics, Public Policy and Social Work, 1(3), 1-13.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Identity of Dream Home: An architecture review

IF Bambang Sulistyono, Silmi Cahya Pradini Priliana*
**Corresponding Author*

Interior Design Departmen Faculty of Fine Arts and Design,
Universitas Sebelas Maret, Surakarta, Indonesia

ifbambangsulistyono@staff.uns.ac.id[1], silmi.priliana@staff.uns.ac.id[2]
Tel: +393891961445

Abstract
A home is a basic human need, a place where life takes place. Inside the home there are many activities according to the number of occupants. Thus, the characters of the occupants are also diverse. The purpose of this writing is to define a good home and be able to become an identity based on the representation of the character of its occupants. Describing a home through poetry in a descriptive narrative way provides a broader and interpretive explanation. A home should be able to accommodate the needs of life and the character of its occupants.

Keywords: Character; identity, home

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6170

1.0 Introduction

There are many parables about "home", including "a place of preservation" and "a place of refuge where we begin to live". “Home” also suggests a place where our dreams wander about longing for the past and our childhood (nostalgia), whether it is our parents' house, something valuable from the hometown or homeland environment, or the house we now live in.

Home is an environment of universal feelings of protection, kinship, and comfort, and this is different from the feeling of pleasure on vacation in various tourist destinations and entertainment venues, such as in big cities, beaches, and mountains. As Pedro Arrupe said that we need to deeply comprehend, a house is much more than a building. It is the social context of family-life-the place where man loves and shares with those who are closest to him (Eko Budiharjo: 1987).

Many people still think of a house as just a place of shelter from natural physical factors, hot sun, wet rain, cold wind, and unwanted human or animal disturbances. The house is only seen as a final product, not as a dynamic process.

Some of the concepts regarding the meaning of a house as a home put forward by Hayward (Eko Budi Hardjo: 1987) include: Home is an embodiment of identity, namely as a symbol and reflection of the values of the personal tastes of its residents; Home is a place for

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6170

intimacy, namely a sense of belonging, togetherness, warmth, love, and a sense of security; Home is a place of solitude and privacy, a place to escape from the bustle of the outside world, from pressure, tension, and routine activities; Home is root and continuity, meaning that home or hometown is seen as a place to return to the roots and foster a sense of continuity in the chain of a process to the future; Home is the main place for daily activities; Home is the center of social networks; and Home is a physical structure.

In early human civilization or during prehistoric times, humans did not build their houses but looked for natural caves as shelters for themselves and their families from natural hazards. Then, civilization developed in line with the evolution of the times and the human way of thinking, based on the experiences they learned from the nature around them. This is a manifestation or embodiment of the life of every individual (person) or every group of people, who differentiates or interacts with animals, meaning that humans do not merely live in the midst of nature, but they have the desire to change that nature.

As described above, the homes used by prehistoric humans were in the form of caves that existed in nature and their actions were still an instinct to reach a place of shelter from all the natural dangers of their environment. In other words, prehistoric humans were not yet cultured.

The changes in time and the development of the human population, as well as their improvement in reasoning, have resulted in the growth of the need for better housing from the limited number of caves. They thought and saw natural phenomena and made analogies with events around their environment. They observed and learned from animals' behaviors in building nests, such as birds making cages from small branches and dry grass, or observing wild boars making their nests in the middle of thick weeds by forming cones from the stalks of the weeds.

2.0 Literature Review

2.1 Human and Culture

The process that humans have gone through, starting from thinking or having ideas that are repeated, to realizing their ideas in finding the form of home most suitable for them as a place to live has proven that humans have entered the cultural level.

There are three major characteristics or manifestations of culture (F. Christian J; 1992) which include thinking, doing, and having.

1. Thinking (ideas)

Thinking is an ideal form, which is abstract and consists of a complex of ideas, values, norms, and regulations.

2. Doing (normas)

Doing is the form of behavior, activity, social system, or work, which is a complex pattern of behavioral activity from individuals in society, and human interaction.

3. Having (things)

Having takes the form of human work that is concrete/real and a complex of physical results and activities, actions, and work of all humans in society.

The physical 'house' as a result of human creation in realizing the ideas into concrete forms is included in the category of building art or architecture art. Furthermore, it has been proven historically that the dynamics of building art always move in line with the cultural dynamics and social dynamics of society. Architectural art is a human product, both as a group in society and as individuals in society. Therefore, the socio-cultural dynamics of society will always influence the dynamics of architecture. Architecture is part of a culture, and certain cultural values will be revealed and embodied in architectural works, or in other words, architecture is a manifestation of cultural values, either individually or in groups of people. The orientation of these cultural values, according to Clyde Kluckhohn, is determined by five fundamental problems in human life, namely the nature of life, the essence of work, the human perception of time, the human view of nature, and the nature of humans with each other (Koentjaraningrat: 1980).

Culture will never be separated from the development of human life. Culture is part of life, in the form of views on life, attitudes to life, ways of life, and the results of human life. Life will develop and change based on the development and change of all aspects and values in human life. Humans are dynamic creatures, different from animals or plants. Humans have desires, feelings, and aspirations that are based on their minds that can develop or shift at any time. This surely makes human culture change, along with the dynamics of human life. This signifies that culture has always been and will always change, instead of static or rigid.

In essence, cultural changes and shifts will always affect conditions and dynamics in architecture, which is also part of a culture. For example, the culture of traditional society in the archipelago will provide an architectural 'color' that is different from the 'color' produced by the culture of the traditional society. In viewing the relationship between humans and nature, traditional society is oriented towards harmony with nature, which is clearly expressed or reflected in physical expressions and architectural conceptions.

On the other hand, traditional societies tend to start exploiting their natural environment. Many of the architectural works of transitional societies seem arrogant towards nature and not familiar with their surroundings. There is a feeling that buildings in big cities have experienced a lessening of values and have experienced an extinction in terms of orientation towards their environment. This concession, in the end, is a means of accelerating the actions of architectural manifestations that damage the environment.

2.2 Culture and Identity

Culture provides an opportunity to perceive the relationship between ideas and real human action. Giving meaning to life is an important action of humans in creating their identity. In this essence, life is an interaction between humans and their absolute environment, including beliefs and values.

Talun Village is an ideal case study for exploring these dynamics in this context. It represents a specific cultural and geographical setting, reflecting regional culture while showcasing local adaptations and practices (Gong et al., 2022; Levinson, 2005). The village's distinctive blend of traditional and contemporary elements provides a valuable case study for examining the interplay between culture and environment (Ellen, 1986; Lynch, 1960). This research will cover its physical, cultural, and symbolic dimensions. It includes documenting architectural features, public spaces, and natural elements, their meanings, and the social interactions they facilitate. We aim to provide a holistic understanding of the village's landscape by integrating visual documentation, ethnographic fieldwork, and participatory research. From a design perspective, this research will use photography, sketching, and mapping methodologies to capture the village's design and spatial characteristics. Community engagement activities will help reveal how residents interact with their environment (Benediktsson & Lund, 2010; Gong et al., 2022; Lynch, 1960; Tuan, 2001). This approach will enhance our understanding of the cultural landscape and contribute to sustainable design practices that respect and preserve cultural heritage.

What a person does depends on what he wants (his value) and what he thinks is right (belief). Culture is reflected in behavior, and therefore, the concept of culture is functional. In other words, culture is action, behavior, and struggle to enhance human dignity. According to Ismail (1989), identity is an embodiment that is like a mosaic of a personality, which is potential, unique, superior, and inspiring to produce a specific image. Identity is a process, not an 'object' that is found, created, produced, or made up. Identity is a network of relations from traces of civilization and culture that go hand in hand with the passage of time in human history.

Subjectively, identity refers to the meaning of individuality, which reflects its difference from other objects, as well as its recognition as a separate intensity. Meanwhile, objectively, identity is a complex of values framed by a system and showing affinity or relationship as well as giving a specific character to the environment and culture that is absorbed by each individual. For individuals and society, identity can be a way of thinking, feeling, and acting as a certain way of life that has been formed in previous times. This way of life will determine the role played, and will always be experienced as a continuity within an individual and in relation to what is outside of the individual. If the embodiment of identity is considered as a process, which has been formed in the past, it will always remain and experience changes and renewals that adapt to demands and progress without losing their personality, and humans as groups or individuals in the spatial dimension will always have a tendency to showing identity. This tendency is motivated by a sense of pride and love for the environment in which they live.

Expression of identity is reflected in several aspects, such as behavior, speech, manner of dressing, type of food, artistic expression, and style of buildings, all of which provide characteristics of a society with a particular culture and certain limits that distinguish it from the others. Meanwhile, there are two forms of identity, namely the physical and the non-physical, or the tangible and intangible. The identity needs to endeavor not only to lead to the mere formation of symbols so that it is attached to something existential. Identity is inherent in various aspects and conditions so that some of the dimensions are visible and vice versa, while others are invisible.

Based on the description above, identity is reflected and manifested in the elements of culture, which, according to Koentjaraningrat (in Ismail: 1989), consists of seven elements, namely: language, technology system, livelihood or economic system, social organization, knowledge systems, religion, and arts. Through these seven elements, identity can be traced both physically and non-physically, and the most vital is the sense of identity, which is generally interpreted as a characteristic that differs from one another.

3.0 Methodology

Descriptive method is a research method that attempts to describe a symptom, event, incident that occurs at the present time. Descriptive-narrative method is a research method, by observing and examining textual narratives to describe a symptom, event, incident that occurs.

The research begins with data collection. Namely using poems as a tool or way to get a picture of the house as an identity with the events in it to draw conclusions afterwards. This research does not require any treatment or manipulation of variables, because the symptoms and events already exist and the researcher only needs to describe them.

4.0 Findings and Discussion

4.1 Home as an Identity

If a home is a manifestation of cultural values, while a culture contains an identity, then by analogy, it can be said that a house is an identity. Humans have unforgettable memories of childhood homes. Home is not only a 'shelter' in the form of wall boundaries with a roof covering, but it is something that has its shape, color, doors and windows, rooms, beds, cupboards, mirrors, tables, chairs, bathrooms, toilets, paintings, wall clocks, and others that shape and reflect the owners' identity.

The reflection of identity in traditional family homes in Eastern countries is rich and complex. This is because the cultural system that applies and adheres to is also complex, as mentioned in the previous discussion by involving elements of the universe combined with elements of the present environment (real world), resulting in concepts realized from the philosophy of symbols that are linked in ornaments with a particular meaning. In his poem entitled "*Rumah (Home)*", Darmanto Yatman (1982) fully alludes to the position of home in the complexity of identity and traditional Javanese society, as depicted in the fragments of the poem.

"…….. Rumah itu Omah,
Omah itu dari Om dan Mah
Om artinya O, maknanya langit, maksudnya ruang, bersifat jantan.
Mah artinya menghadapi ke atas, maknanya bumi, maksudnya tanah, bersifat betina.

Jadi rumah adalah ruang pertemuan antara laki dengan rabinya.
Karenanya kupanggil kau semah, karena kita serumah…"

Translation:
"…….. Home is Omah,
Omah is from Om and Mah
Om means O, which means sky, space, masculine.
Mah means facing upwards, which means earth, land, female.
So, home is a meeting between man and God.
That's why, I call you housekeepers, because we live in the same house…"

This fragment of the poem has implied religious meanings about the relationship between two cultural players, namely the types of men and women in forming their identities under the same roof as husband and wife. This is so because the relationship between husband and wife in marriage in Eastern culture is obligatory in terms of social and religious aspects. Moreover, there is a power beyond humans in this world that exists in Western and Eastern cultures.

The following fragment of the poem is a yard that is wide enough as a place to play, garden, and do such relevant activities.

"…….. Saparuh pelataran rumah kita
Bersih cemerlang,
Supaya bocah-bocah dolan pada krasan,
Memanggil-manggil bulan dalam tetembangan
Mumpung gede rembulane
Mumpung jembar kalangane
Surak-surak: Horee!
Di kiri dan di kanan rumah ada pekarangan
Di mana biasa orang menanan jamu-jamuan
Jahe untuk menghangatkan tubuh kalau lagi selesma
Kencur untuk mengompres kalau lagi babak belur
Kunir supaya anak yang dikandung kuning lencir…"

Translation:
"……. Half of our yard
brilliant clean,
So that the children play at home,
Calling the moon in songs
While the moon is big
While the yard is wide
Hooray! Hooray!
On the left and right of the house, there are yards
Where people usually plant herbs
Ginger to warm the body when you have a cold
Kencur to compress when you are hurt
Turmeric to make the child in the womb has bright skin…"

4.2 Traditional Houses

Traditional houses usually have very large yards, possibly because the population is sparse, and the land is large and has not been exploited by land speculators for real-estates that contribute to high land prices. Children have larger areas, such as backyards, side yards, and front yards, for playing various traditional games that can improve their health and shape their personality to be not individualistic as well as like to interact with neighbors and other people, to improve togetherness in happiness and sadness. Traditional games are different from modern games, which are digital and do not require friends to play.

Togetherness can foster a spirit and identity to work together, a common destiny which is also the nature of traditional society in dealing with all the problems in life in their environment. The following fragment of the poem also relates to home.

"…….. Inilah pendapa rumah kita,
Mandala dengan 4 saka guru dan 8 riang penjuru,
Di sinilah kita akan menerima tamu-tamu kita,
Sanak kadang, tangga teparo
Yang nggaduh sawah, ladang atau raja kaya kita, merembuk sesuatu untuk kesejahteraan bersama.
Di mana kelak kau bisa duduk bersila bersam anak-anak
Menyaksikan dalam karungrungan
Menghidupkan ringgit wayang ditangannya
Medar kebijaksanaan sastra jedra
Lewat tutur, suluk dan tembang……..."

Translation:
"……. This is our home,
Mandala with 4 pillars and 8 corner rooms,
This is where we will welcome our guests,
Relatives, neighbors
Those who work together in the fields, the places to plant, discuss something for the common good.
Where you will be able to sit together with the children
Watching the mountain of longing
Reviving wayang in his hand
Explaining the literary wisdom of Jedra book
Through speech, magic, and songs ……"

The *pendapa* (pavilion) is used as a living room and a place for family social activities, especially for fathers or men when discussing work. Apart from that, there is a *pringgitan* room (a room that connects pavilion and main house) that can be used to watch art performances (usually shadow puppets), which are presented on certain occasions, such as *ruwatan* (ceremony to get rid of bad luck), weddings, and birthday parties.

"…….. Di belakang peringgitan itulan senthong,
Di mana pusaka nenek moyang kita memancarkan pamornya,
Menjaga kita dari segala mala petaka,
Di sinilah kita sama di, merukunkan diri dengan Allah,……."

Translation:
"……. behind *pringgitan* is a *senthong* (chamber),
Where the heritage of our ancestors radiates its prestige,
Protect us from all misfortune,
This is where we meditate, reconcile ourselves with Allah,……"

Senthong means room, which is a very private space, only used by each resident. There are a room for parents and a room for children called g*andhok*. The activities that people do in the rooms are private, either physical or non-physical activities, such as taking a rest, sleeping, and praying to get closer to God as the sole ruler in this universe.

"…….. Nah di muka gandhok itulah sepen kita,
Dengan tanda rajah: hai kau member lapar, berilah kekenyangan!
Di atasnya Dewi Sri,
Di depan pintu Cingkarabala dan Balaupata,
Menjaga sepen kita agar tetap sepi dari hama,
Menjaga rejeki kita dari para durjana,
Merekalah yang akan membuka sepen kita,
Bagi para papa yang membutuhkan bantuan kita,
Dan akhirnya,
Di sinilah garase untuk kerbau dan sapi kita!
Somahku,
Di bawah atap inilah kuserahkan sapu rumah ketanganmu,
Jadikanlah la kolam bagi ikan-ikan,
Jadikanlah ia sawah bagi padi-padian,
Jadikanlah ini rumah Karena disini lah kasih bertempat tingggal,
……."

Translation:
"……. So, in front of the *gandhok* is our room,
With an amulet sign: O you give hunger, give satiety!
On it is Dewi Sri,
At the door are Cingkarabala and Balaupata,
Keeping our pantry so that it remains far from pests,
Guarding our fortune against evildoers,
They're the ones who will open our pantry,
For the papas who need our help,
And finally,
This is the garage for our buffalo and cows!
my household
Under this roof, I leave the house broom in your hands,
Make it a pond for the fish,
Make it a field for grain,
Make this a home for this is where love dwells,

……."

The fragment above illustrates that in a traditional house, there is a barn or warehouse to keep food, which can later be used by the family for food supplies and to provide assistance to those in need. In modern society today, a place to store food is more practical and simpler, such as a refrigerator. The traditional society also has a garage or pen for buffaloes and cows or other domestic animals as their assets, but modern society tends to manifest assets in the form of vehicles, whether bicycles, motorcycles, or cars.

Women have also been described as house managers because they play the role of mothers of their children and housewives. The home will be orderly, neat, peaceful, and healthy, as well as build a complete image or identity that is memorable and engraved in the minds of children to continue and embody the values in the future.

5.0 Conclusion and Recommendations

Childhood in the parents' house will always be imprinted in people's minds, especially memories of a mother as the most dominant parent in shaping personality and character so that children inherit an identity that in principle does not change until they become parents. During childhood, home is also a place to play with siblings or family. The home has a courtyard with trees, rooms, and tables that can be used as a safe hiding place when playing hide and seek and a place to hide when parents scold.

During their teenage years, people will use the home as a typical base, especially a private room that is managed based on their taste. The room seems to be a territory or an area that no one can disturb, let alone change the spatial layout. Teenage boys tend to choose room paint colors that are different from the colors of other rooms in the house. They will put up posters of movie stars or sports players as their idols. Sometimes, they also play loud music in the room. Meanwhile, teenage girls tend to choose soft room colors and arrange rooms neatly. They prefer a quiet atmosphere in the room and hang mirrors on the walls when touching up. Separation of rooms for children occurs at the beginning of their teenage or adulthood lives.

The character of each occupant will shape the image of the space and the image of the house itself. A house is a need that is not only basic, but also very private. Private means that a house is a reflection of the identity and character of its occupants. The character of the house influences the character of the environment. An environment with character also determines the character of a nation.

To design a good house, the designer must understand the character of its occupants. Determining the spatial program in a house is influenced by the needs of the homeowner. Often the spatial design in a house can deviate from existing standard rules. This is partly because it facilitates the very specific needs of its occupants. Each occupant has their own story. A house is essentially a very personal form of design.

Acknowledgements

The authors would like to thank *Lembaga Penelitian dan Pengabdian Kepada Masyarakat (LPPM)* - Sebelas Maret University Surakarta.

Paper Contribution to Related Field of Study

All authors contributed to the study conception and design.Material preparation, data collection, and analysis were performed by [IF Bambang Sulistyono] and [Silmi Cahya Pradini Priliana]

References

Budiharjo, E. (1987). *Percikan masalah arsitektur, perumahan, perkotaan*. Gadjah Mada University Press; Yogyakarta.

Christian, F. & Tanudjaya, J.S. (1988). Pengantar kepada apresiasi budaya. Penerbitan Universitas Atma Jaya: Yogjakarta.

Gallery (magazine). October 1982. Darmanto Yatman's Poems. FT Undip: Semarang.

Ismail. (1989). *Wawasan jatidiri dalam pembangunna daerah.* Effhar dan Dahara Prize: Semarang.

Markus, C. (1990). *Self-identity and the house (in Lisa Taylor (Ed) Housing: Symbol, structure, site.* Rizzoli: New York.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta
https://arcadesa.isi.ac.id/index.html
8th Art, Craft and Design in Southeast Asia International Symposium
ISI Yogyakarta Indonesia, 27-28 September 2024
Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Interiority Study: Quality of interior rental flats desired by low-income communities in urban areas

Muhamad Sholahuddin

Interior Design Department, Faculty of Visual Art,
ISI Yogyakarta, Yogyakarta, Indonesia

adin.psdi@gmail.com
Tel: +628156873970

Abstract
Objective: to identify what interiority looks like and the interior quality (flexibility and adaptability) of rental flats, and to find out the residents' actions to overcome it. Method: descriptive qualitative to understand social reality. Results: Interiority: The concept of interior flexibility is that there is no change in vertical partitions, horizontal planes, and levels, and the flexibility of furniture in type and use is flexible. Adaptation concept: spatial adaptation, communal space, privacy space, condition, and aesthetics. Conclusion: Interiority and interior quality in the interior of flats can be used to create vertical housing that is efficient, affordable, safe, and supports communal living.

Keywords: Interiority; interior; quality; flats

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6171

1.0 Introduction

City development is always in line with population growth. Population growth has spatially severe consequences, namely the need for land as a place to live. The current situation is that many people need help to afford to live in decent houses, especially in areas around urban areas. This can result in the emergence and formation of slum areas. The construction of flats is expected to encourage urban development and improve the quality of settlements on limited land.

According to Lawi (2018), collective housing problems at the apartment building scale: the building is too monotonous; there is a lack of natural light and air circulation; units are small and crowded; there are Inflexible units, narrow and long corridors, there is a lack of collective space, far from health facilities, far from active facilities, far from educational facilities. Lack of green open space. Simple rental flats that have been established and used in DIY include Rusunawa Cokrodirjan Kodya Yogyakarta (R1), Rusunawa Bener Kodya Yogyakarta (R2), Rusunawa Graha Bina Harapan Kodya Yogyakarta (R3), Rusunawa Mranggen Gedung Hijau Sleman (R4), Rusunawa Dabag Sleman (R5), Rusunawa Gemawang Sleman (R6), Rusunawa Tambak Projotamansari 2 Bantul (R7), and Rusunawa Tuksono Kulonprogo (R8).

Research problem formulation: What are the interior flexibility problems of residential units in simple rental flats (rusunawa) in Yogyakarta? What adaptations do residents of Rusunawa in Yogyakarta make to overcome flexibility problems?

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6171

The research aims to identify the interiority; flexibility and adaptability of the interior of residential units in rusunawa in Yogyakarta, and find residents' actions to overcome these problems.

2.0 Literature Review

2.1 Interiority

Interiority, or the quality of interior space, is the concept of limitation and openness, both physically and culturally. Physically, interiority is the product of boundaries; culturally, it implies the presence of others, or the outside, to create the conditions that make it inside. The presence of the exterior demands a relationship between what is outside and what is inside. Design professionals work with interiority as a space created and conditioned by the exterior by the building's walls, form, or skin.

According to Cindy Coleman (2002), interiority, or the quality of interior space, is a concept of boundedness and openness, both physically and culturally. Within boundaries, interiority is created, but culturally, it requires the other, or exterior, to create the conditions that make it inside. Interiority, or the quality of interior space, is the concept of limitation and. openness, both physically and culturally. Physically, interiority is the product, while culturally, boundaries imply the presence of the other, or the exterior, to create the conditions that render it inside. According to Nickvdleek, the definition of interiority is as follows: 1). interior quality or character, and 2). inner life or substance: psychological existence. Interiority/interiority is the quality or character of interiority and inner life or substance: psychological existence (https://www.instagram.com/nickvdleek/p/Bolx_96FrTG/).

Interiority is an approach or concept that creates a quality of space within a building. Designing interiority involves several aspects of the “experience of a five-space”, which can be done by Understanding the context (social, cultural, and history of the space and the user). It helps create a design that suits and reflects the user by considering the context, social, cultural, and history of the space and its occupants. Representing subjective life by also focusing on the inner lives of users, not only focusing on aesthetics, creating a sense of boundedness and openness to create a sense of comfort and openness for the user, Considering the relationship between space and activity by creating functional spaces that encourage specific activities and roles, and incorporating sustainable and progressive design. It is essential to consider the environmental impact on users' welfare (Ionescu, 2018).

Interiority is a spatial concept and a union between body, mind, and space. The presence of the self creates a sense of comfort and user interaction with the space to carry out the best possible activities. Interiority becomes important when behavioural issues are ddressed. Interiority can be defined as the thoughts, feelings, and reactions of character struggles and how we behave. Interiority in Rusunawa housing refers to the optimal interior design and layout to create a comfortable and functional space for the occupants. Interiority is how interior design elements such as lighting, colour, texture, and furniture interact and create a pleasant atmosphere in the flat. A successful interior design will consider factors such as efficient use of space, good organisation, and occupant comfort as top priorities. The flats' interiority can create an inspiring and relaxing environment by considering the occupants' needs and preferences.

A house is an activity system. Any change in the use of the house, occupant and physical needs, and cultural environment requires a flexible system to adjust according to the changes. In general, flexibility is the ability and potential of a building to change, adapt, and reorganise itself in response to change (H. Estaji, 2017). Typically, researchers and architects use “flexible” for physical changes and “adapt” for non-physical changes. Steven Groak (1944-1998) defined “adaptability as the ability of different social uses and flexibility as the ability of different physical arrangements”.

Flexibility is the ability and potential of a building to change, adapt, and reorganise itself in response to change (H. Estaji, 2017). According to Carmona et al. (2003), the concept of flexibility is temporary and can change according to the needs of user activities. The flexibility of space is studied on the temporary nature that can be seen from three aspects of the temporal dimension: time cycle and time management, continuity and stability, and implementation over time.

Flexibility is defined as the ability to adjust. Flexibility can mean adjusting the space by utilising one or more of its functions in a space. Flexibility of space use is also a characteristic of the possibility of using a space for various properties and activities, and it can be done by changing the arrangement of space as needed without changing the order of the building.

Flexible buildings can accommodate occupants' activities and allow for changes. One factor popularising flexible architecture is the development of human creativity to meet people's needs better. “Where functional problems have necessitated a responsive, built environment, flexible architecture has formed at least a part of the solution” (Kronenburg, 2007).

According to Toekio (2000), there are three concepts of space flexibility in applying flexible space elements: 1) Expansibility: design spaces that can accommodate growth through expansion as needed; 2) Convertibility: the space design allows changes in orientation and atmosphere without significant overhauls; and 3) Versatility: the flexibility of a multi-functional container to accommodate multiple activities at different times. Emamgholi's theory (2011) mentions three main points that focus on interiors: 1) Flexibility in vertical partitions; 2) Flexibility in horizontal plots and levels; and 3) Flexibility in furniture.

Adaptability is the ability to use different social media, and flexibility is the ability to use different physical settings (Steven Groak, 1944–1998). Over time, changes to buildings are inevitable. Changes in buildings occur due to adjustments between building occupants and their buildings. When building changes benefit occupants, they are positive. Generally, buildings change because they adapt to their surroundings. As Robert Kronenburg stated, "Architecture designed for adaptation recognises that the future is not finite, that change is inevitable, but that a framework is an important element in allowing that change to happen” (Kronenburg, 2007).

Buildings do not experience the same changes; the degree of change depends on the building type. Commercial, domestic, and institutional buildings experience different levels of change. 1) Commercial buildings are buildings for commercial purposes, such as shops, offices, and shopping centers. Commercial buildings adapt quickly. Therefore, commercial buildings often change and are often

called 'forever metamorphic'. 2) Domestic buildings are residential buildings, such as houses and apartments. Changes in domestic buildings are usually stable and not as drastic as in commercial buildings. 3) Institutional buildings are intended as educational institutions, such as schools or campuses. Changes rarely occur in institutional buildings; changes are sometimes avoided so that the system that runs in it does not experience chaos because changes in institutional buildings concern the interests of many people (Brand, 1994). "*Adaptable buildings are intended to respond readily to different functions,* patterns of use, and specific user's requirements of the building" (Kronenburg, 2007).

Adaptable design is a strategy for responding to conditions where a building will not always be inhabited by a person or a group (family) only but by a group of other people who will inhabit the building in the future. With an adaptable architecture approach, the building has the potential to change sustainably. Buildings with adaptable character accommodate changes in the room's layout to respond to changes in the use of the building. This adaptability is based on the context of buildings being flexible to building-use changes. "A room can have many functions simultaneously or at different times." A multi-functional space that can accommodate several activities in one room is a strategy to fulfil adaptable architecture. By providing multi-function spaces, different activities can be done in one room; "the multi-functioning room is a truer answer to modern architecture's concern with flexibility" (Venturi in Lang, 1987).

2.2. Interior

Interior design is the art of building functional and aesthetically pleasing interior spaces. Its essence is the reality of built space that can foster an excellent dialogic atmosphere between humans as users and the space itself.

Definition of interior design from several sources:

1. According to Ching (2002), interior design is planning a building's layout and space to develop the room's function, aesthetic enrichment, and psychological enhancement.
2. According to Standard (1995), interior design is a system or way of organising inner space that can meet the requirements of comfort, safety, and satisfaction of physical and spiritual needs for its users without neglecting aesthetic factors.
3. According to Ching (1996), the scope of interior design includes interior forming elements: floors, walls, partitions, and ceilings; transition elements: doors/main entrance and internal doors and windows; and space-filling elements: furniture and aesthetic elements/accessories.

2.3. Rusunawa

Simple rental flats (Rusunawa) are multi-story buildings built in an environment divided into functionally structured parts in horizontal and vertical directions. They are units, each used separately. The ownership status is leased and managed by the local government and built with APBN or APBD with the primary function of housing (Permenpera No.18/permen/M/2007 concerning Rusunawa Management).

There are two types of runaway: low-rise and high-rise. Regulation of the Minister of Public Works Number: 05/Prt/M/2007 on Technical Guidelines for the Construction of High-Rise Simple Flats defines a High-Rise Rusunawa is a simple flat building with more than eight floors and a maximum of 20 floors. Rusunawa is for low-income people, so the development targets include rusunawa for TNI / POLRI, rusunawa for workers, and rusunawa for boarding education.

3.0 Methodology

This study used a descriptive-qualitative method. A qualitative approach is better able to understand social reality in depth. Reading problems in society or social reality is seen through the five senses and must be listened to and researched through understanding and interpretation (Creswell, 2008). This exploratory research aims to provide various information about flexibility and adaptability problems according to Rusunawa residents in Yogyakarta regarding changes in housing needs.

1.1. Data collection technique

Data was collected through interviews with residents of Rusunawa in Yogyakarta. Respondents were asked open questions to obtain diverse data. Questions were divided into three groups, namely: 1) personal data of respondents; 2) the description of the interior flexibility problem of residential units; and 3) adaptations made by flat residents in Yogyakarta to overcome flexibility problems. The units of observation are 1) flexibility, namely flexibility of vertical partitions, the flexibility of horizontal planes and levels, flexibility in furniture, and 2) adaptation of flat residents seen from activities and time.

1.2. Sample selection technique

This research's respondents were residents of flats in Yogyakarta. Respondents were selected using a snowball sampling technique, namely rolling from one respondent to another (Neuman, 2003).

1.3. Data analysis technique

This research has two units of analysis: 1) flexibility: physical changes, and 2) adaptability: non-physical changes. This research focusses on the flexibility seen in the interior elements of residential units, which can change according to the time and activities of the flat residents.

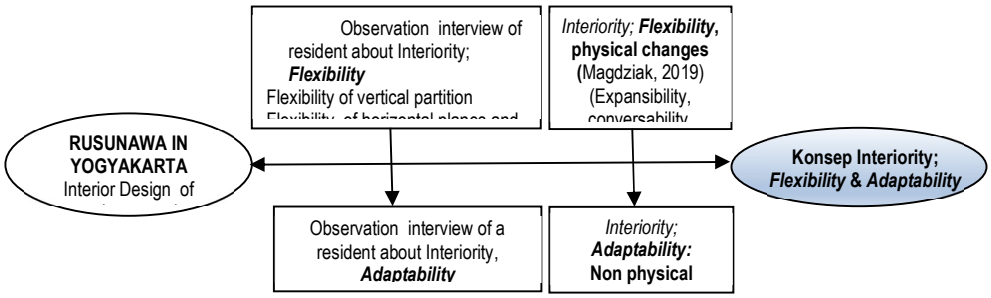


Fig. 1: Research roadmap chart
(Source: Author, 2023)

4.0 Findings

4.1 Typology of residential units in Yogyakarta's rusunawa:

1. Type 24 residential unit; a) has 1 bedroom. (R1, R3, R4), b) has a family room integrated without walls with the bedroom (R1, R3, R6), c) has a separate living room with a bedroom (R4), d) having 2 bedrooms, one of which is a living/family room (R7).
2. Type 36 residential unit; a) has 2 bedrooms (R2, R5); a) has 1 bedroom and a living/family room integrated with an additional bedroom (R8).
3. Furniture in residential units in Yogyakarta rusunawa: a) Tenant-owned, R1, R3, R4, R5, R6, R7, b) Provided by the rusunawa, R2, R8.

4.2 The concept of flexibility in the interior of residential units in Yogyakarta's rusunawa:

1. Flexibility in vertical partitions; a)There is no change in vertical partitions in the rusunawa residential units because there is a regulation about not allowing tenants to change residential units with partitions (R1, R2, R3, R4, R5, R6, R7, R8), b) In Rusunawa Cokrodirjan (R1), tenants use curtains as non-permanent insulation, c) The walls between rooms are made of 6 mm plywood (R7).
2. Flexibility in horizontal planes and levels; a) Mats or carpets are rolled up when not in use. If there are guests or gathering or sleeping activities, mats/carpets are spread out (R3, R4, R5, R6, R8), b) Expansion of clothesline to the corridor as an adaptation because the balcony has no sunlight penetration (R1, R5), c) Expansion of goods into the corridor as a place to store sandals/shoes or others (R2, R4).
3. Flexibility in furniture; a) Furniture is used as a partition between public and private zones (R1, R5, R6), b) Furniture is not yet multifunctional (R1, R2, R3, R4, R5, R6, R7, R8). Multifunctional activities have not been supported by multifunctional furniture. In the general zone in the living/family room, namely the area to receive guests and gather only using mats/carpets and additional activities to sleep using mattresses that are propped up when not in use, c) Bunk beds are provided by the flat but are not multifunctional and are large (R2, R8). Tenants use push mattresses to save space (R7).

4.3 Adaptability by residents of Rusunawa in Yogyakarta to overcome flexibility problems

In general, the activities of rusunawa tenants in residential units are; a) Bedroom: sleep, change clothes, make up, pray, b) Bathroom: MCK, c) Living room and family: working, entertaining guests, watching television, relaxing, family gathering, d) Kitchen: preparing, mixing, serving, washing dishes, e) Balcony: drying and washing clothes, f) Corridor/terrace: receiving temporary guests.

4.4 Time-related residential activities in residential units in Yogyakarta rusunawa:

1. Spatial adaptation to a narrow space layout; a) rest/sleep activities usually in the private zone (in the bedroom) are also carried out in the public zone (living/family room) at night as an adaptation of tenants due to limited additional sleeping space. Mattresses are propped up during the day when not in use (R3, R4, R5, R6, R7), b) eating activities in the living/family room (R4, R5, R7), c) food preparation activities in the bedroom (R2), d) work area activities in the living/family room (R4, R7, R8), e) storage activities in the living/family room (R3, bedroom (R2, R4, corridor (R1), F0 additional drying activities in the bathroom (R6).
2. Adaptation to communal spaces: Residents occupy communal spaces, consisting of the corridor in front of the residence, the hallway near the stairs and the ground floor (R1).
3. Adaptation to limited privacy space: partitioned with curtains (R1), furniture (cupboard/credenza) (R5).
4. Adaptation to space conditions: The activity of sunbathing clothes is done in the corridor if the balcony is not exposed to sunlight in the morning/afternoon (R1, R5).
5. Adaptation of space aesthetics: Greening in the corridor in the form of small plants as greenery (R5). Time-related residential activities in residential units in Yogyakarta rusunawa:
6. Spatial adaptation to a narrow space layout: a) rest/sleep activities usually in the private zone (in the bedroom) are also carried out in the public zone (living/family room) at night as an adaptation of tenants due to limited additional sleeping space. Mattresses are propped up during the day when not in use (R3, R4, R5, R6, R7).b) eating activities in the living/family room (R4, R5, R7). c) food

preparation activities in the bedroom (R2). d) work area activities in the living/family room (R4, R7, R8). d) storage activities in living/family room (R3, sleeping room (R2, R4, corridor (R1), e) additional drying activities in the bathroom (R6).
7. Adaptation to communal spaces: Residents occupy communal spaces, consisting of the corridor in front of the residence, the hallway near the stairs and the ground floor (R1).
8. Adaptation to limited privacy space: blocked with curtains (R1), furniture (cupboard / credenza) (R5).
9. Adaptation to spatial conditions: The activity of sunbathing clothes is done in the corridor if the balcony is not exposed to sunlight in the morning/afternoon (R1, R5).
10. Adaptation of space aesthetics: Greening in the corridor in the form of small plants as greenery (R5).

The Interiority: the concept of space flexibility that can be in the residential units of Rusunawa in Yogyakarta:
1. Expansibility is a space design that can accommodate growth through expansion as needed. However, residential units do not allow horizontal and vertical expansion due to space limitations and manager regulations.
2. Convertibility: The space's design allows changes in orientation and atmosphere without a significant overhaul. Convertibility in residential units is through furniture layout as needed. The orientation and atmosphere stay mostly the same; only the space layout reduces the privacy level in the public zone, which is blocked by furniture.
3. Versatility is the flexibility of a multifunctional container to accommodate multiple activities at different times. Residential units can be versatile by optimising the function of multifunctional living rooms by adding eating, working, gathering, and resting activities at different times.

The concept of flexibility in the Rusunawa residential unit in Yogyakarta is the concept of convertibility and versatility applied to the space envelope elements.

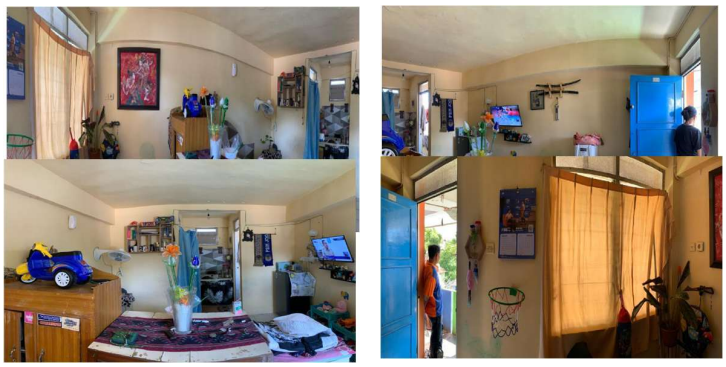


Fig. 2: Unit hunian tipe 24 m^2 di Rusunawa Cokrodirjan
(Source: Author, 2023)

5.0 Discussion

A flexible building can accommodate the activities of its occupants and allow changes to occur within the building. The development of human creativity to better meet their needs is one of the factors that later popularised flexible architecture. "*Where functional problems have necessitated a responsive, built environment, flexible architecture has formed at least a part of the solution*" (Kronenburg, 2007). Emamgholi's (2011) theory regarding the concept of flexibility in interiors, namely: 1) flexibility in vertical partitioning, 2) flexibility in horizontal plane and level, and 3) flexibility in furniture. A space's flexibility is defined as adapting one or more functions. Flexibility in the use of space means that a space can be used for various characteristics and activities. It can be done by changing the spatial arrangement according to needs without changing the layout of the building. There are two concepts of flexibility in the interior of residential units in Rusunawa Yogyakarta:

5.1. Flexibility in vertical partitioning

No changes are made to vertical partitions in flat residential units because regulations prohibit tenants from changing residential units with partitions (R1, R2, R3, R4, R5, R6, R7, R8).
a. In Rusunawa Cokrodirjan (R1), tenants use curtains/curtains as non-permanent partitions.
b. The walls between the rooms are made of 6 mm ply7).

5.2. Flexibility in the horizontal plane and level:

a. Mats or carpets are rolled up when not in use. If there are guests or gathering or sleeping activities, a mat/carpet is laid out (R3, R4, R5, R6, R8).
b. The clothesline was moved into the corridor because the balcony doesn't get sunlight (R1, R5).
c. Expanding items into the corridor as a place to store sandals, shoes, or other things (R2, R4).

5.3. Flexibility in furniture:

a. Furniture is partitioned between public and private zones (R1, R5, R6).

b. Furniture still needs to be multifunctional (R1, R2, R3, R4, R5, R6, R7, R8). Multifunctional activities still need to be supported by multifunctional furniture. In the public zone in the living room/family room, namely the reception and gathering area, only a mat or carpet is used, and a mattress that is propped up when not in use is used for additional sleeping activities. Flatbeds are provided in flats but are not multifunctional and large (R2, R8). Tenants use slide-out mattresses to save space (R7).

Residential activities related to time in residential units in *Rusunawa* Yogyakarta:

a. Spatial adaptation to narrow spatial layout:

1. Rest/sleeping activities usually occur in the private zone (bedroom). They are also carried out in the public zone (living/family room) at night as an adaptation for tenants due to limited additional sleeping space. The mattress is propped up during the day when unused (R3, R4, R5, R6, R7).
2. The activity in the living/family room (R4, R5, R7) is eating.
3. The activity in the bedroom (R2) is preparing food.
4. Work area activities in the living/family room (R4, R7, R8).
5. storage activities in the living/family room (R3), bedroom (R2, R4), and corridor (R1).
6. the activity of drying clothes in the bathroom (R6)

b. Adaptation to communal spaces: Residents occupy the communal space, which consists of the corridor in front of the residence, the hallway near the stairs, and the ground floor (R1).

1. Adaptation to limited privacy space: partitioned with curtains (R1), furniture (cupboard/credenza) (R5).
2. Adaptation to spatial conditions: If the balcony is not exposed to sunlight in the morning/afternoon (R1, R5), clothes-drying activities are carried out in the corridor.
3. Aesthetic adaptation of space: greenery in the corridor in the form of small plants as greenery (R5).

5.0 Conclusion and Recommendations

Interiority: The quality of flexibility and adaptability of interiors in residential units in rental flats in Yogyakarta, as well as the actions of residents in dealing with the interiority and the concept of interior design.

5.1. The Interiority: the concept of flexibility in the form of physical changes:

a. Flexibility in vertical partitions: The vertical partition in the dwelling unit does not change, but for non-permanent partitions, the occupants use curtains and plywood walls.

b. Flexibility in horizontal and level planes: Flat residents can use mats or carpets that are rolled up when not in use.

c. Flexibility in furniture: Furniture is also used as a room divider. Multifunctional furniture is not used in rooms that are already multifunctional. Residents' sleeping needs, sliding beds, and additional mattresses are used to save space. In addition, bed furniture is designed as a bunk bed that can be used as a storage area.

5.2. The concept of interior design adaptation to residential units in flats in Yogyakarta:

a. Spatial adaptation to a narrow space layout:

b. Residents rest in the living room/family room at night, which serves as an extra bed. If not used during the day, the mattress is propped up.

c. Residents' eating activities are in the living room/family room.

d. Food preparation activities are carried out in the bedroom

e. Work activities are carried out in the workroom.

Acknowledgement

Thank you to the government of Daerah Istimewa Yogyakarta and the residents of Rusunawa, who participated in this research.

Paper Contribution to Related Field of Study

The fields of study related to this paper are interior design and architecture.

References

Brand Steward. (1994). *How Buildings Learn: What Happens After They're Built*? New York: Penguin Group.

Carmona, Heath, Oc, Tiesdell. (2003). *Public Places: Urban Spaces, The Dimension of Urban Design.* Oxford: Architectural Press.

Cresswell. (2008). Research Design. (A. Fawaid, Ed.). Yogyakarta: Pustaka Belajar.

Ching, F. D. K. (1996). *Ilustrasi Desain Interior*. Jakarta: Erlangga.

Ching, F.D.K. (2002). *Arsitektur: Bentuk, Ruang dan Tatanan*. Jakarta: Erlangga.

Coleman, Cindy. (2000). Interior design handbook of professional practice. New York: McGraw-Hill.

Emamgholi, E. (2011). Flexible Spaces in Architecture.Sastechjournal, 1-8

Groák, Steven. (1992). The idea of building: thought and action in the design and production of buildings. London: E & FN Spon.

H. Estaji. (2017). "A Review of Flexibility and Adaptability in Housing Design", International Journal of Contemporary Architecture"The New ARCH"Vol. 4, No. 2 (2017) University of Applied Arts Vienna, Austria.

Ionescu, Vlad. (2018). The Interior as interiority. Palgrave Communications. Faculty of Architecture and Arts, Hasselt University, Hasselt, Belgium. DOI: 10.1057/s41599-018-0088-6 | www.nature.com/palcomms

Kronenburg, Robert. (2007). *Flexible: Architecture that Responds to Change*. London: Laurence King Publishers.

Lang, Jon. (1987). Creating Architectural Theory: The Role of the Behavioral Sciences in Environmental Design. New York: Van Nostrand Reinhold.

Lawi (2018), Lawi, Gloria Fransisca Katharina. (2018). Ini 10 Masalah Rumah Susun Versi Pemerintah, Apa Saja? Internet: https://m.bisnis.com/amp/read/20181002/49/844640/ini-10-masalah-rumah-susun-versi-pemerintah-apa-saja [02 Okt 2018].

Magdziak, Monika. (2019). Flexibility and Adaptability of the Living Space to the Changing Needs of Residents. Bialystok University of Technology, Faculty of Architecture, ul. Oskara Sosnowskiego. IOP Conf. Series: Materials Science and Engineering. Bialystok, Poland: IOP Publishing.

Toekio. (2000). *Dimensi Ruang dan Waktu*. Bandung: Intermatra.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta
https://arcadesa.isi.ac.id/index.html
8th Art, Craft and Design in Southeast Asia International Symposium
ISI Yogyakarta Indonesia, 27-28 September 2024
Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Cultural Microcosm in Focus: Landscape and identity in small village explored through design and environment-behavior theories

Nandang Septian

Industrial Design Program,
Institut Seni Indonesia Yogyakarta, Yogyakarta, Indonesia

nandangseptian@isi.ac.id
Tel: +6285156019116

Abstract
The cultural microcosm of a small village, in this case, Talun Village, is examined through environment-behavior studies, particularly the theories of Amos Rapoport and Kevin Lynch. The research uses a qualitative case study approach, including ethnographic fieldwork and visual documentation. It explores how cultural practices, social interactions, and environmental adaptations shape the village's landscape and identity. Key findings reveal that Talun Village's environment is structured around five aspects: acceptance, clear boundaries, appropriate rules, latent activities, and relation to other settings. The village features distinctive paths, landmarks, edges, and cultural influences on spatial organization, offering insights into landscape design and identity.

Keywords: Microcosm; landscape; environment-behavior theories

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6172

1.0 Introduction

The interaction between culture, environment, and people can shape a space or landscape, giving it unique value. While often viewed broadly, this dynamic can also be significant in smaller areas. In this context, the concept of a cultural microcosm offers a focused perspective for exploration. A cultural microcosm serves as a valuable analysis of the interactions between culture, environment, and behavior in a small and self-contained setting (Ellen, 1986; Levinson, 2005; Rosso, 2009; Sun, 2020). This research features a small village, providing insights into how people, their behaviors, and their surroundings are interconnected, offering a detailed view of these complex relationships (Ellen, 1986; Gong et al., 2022; Lynch, 1960; Sun, 2020). Amos Rapoport's theory in Environment-Behavior Studies emphasizes the mutual influence between humans and their environments (Rapoport, 1977). According to Rapoport, the built environment impacts human behavior and cultural practices, while human activities and artistic expressions shape the physical environment (Rapoport, 1990). Therefore, understanding these interactions requires examining them at various scales, from individual buildings to entire communities.

Talun Village, located in Pandeglang Regency, Banten Province, Indonesia, is a representative case for exploring these dynamics in this study. It represents a specific cultural and geographical setting, reflecting regional culture while showcasing local adaptations and

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6172

practices (Gong et al., 2022; Levinson, 2005). The village's distinctive blend of traditional and contemporary elements provides a valuable case study for examining the interplay between culture and environment (Ellen, 1986; Lynch, 1960). Therefore, this research aims to highlight how cultural practices, social interaction, and the environment shape the landscape and identity of Talun Village according to the theories of Amos Rapoport and Kevin Lynch. This research will cover its physical and cultural dimensions. It includes documenting architectural features, public spaces, natural elements, their meanings, and the social interactions they facilitate. Thus, the research objective is to provide a holistic understanding of the village's landscape by integrating visual documentation and ethnographic fieldwork.

Furthermore, community engagement activities will help reveal how residents interact with their environment (Benediktsson & Lund, 2010; Gong et al., 2022; Lynch, 1960; Tuan, 2001). This approach will enhance the understanding of the cultural landscape. Ultimately, this study will deepen theoretical knowledge in Environmental Behavior Studies and offer practical insights for designing cultural environments. The findings will be a valuable resource for academics and practitioners interested in the intersection of culture, environment, and design.

2.0 Literature Review

2.1 Contributions of Amos Rapoport and Kevin Lynch

Amos Rapoport presented the foundational relationship between built environments and human behavior, which is very important in understanding the cultural microcosm of Talun Village (Rapoport, 1990). In particular, his theory emphasizes that cultural variables's role in structuring environmental preferences and behaviors is most appropriate.

According to Rapoport, the effectiveness of a built environment is contingent upon its fulfillment of five key aspects: accepted by people and used by them, the appropriate definition of boundaries, congruence with appropriate rules, consideration of latent aspects of activities, and relation-and-lead to other settings (Rapoport, 1977). As such, the built environment expresses or communicates non-verbally the cultural values and social structures of people, according to Rapoport (Rapoport, 1990). The level and use of spaces in Talun Village are closely linked with cultural practices and social interactions, thus strengthening the argument put forward by Rapoport that cultural context is paramount in environmental design.

The most essential principles in understanding how the residents perceive and navigate the environment in Talun Village were imageability and wayfinding, which Kevin Lynch developed. This theory is concerned with physical elements constructing the mental image of the environment; path, node, landmark, edge, and district—which formulate a cognitive map of the community (Lynch, 1960). Especially in Talun Village, these things are crucial in shaping how residents interact with their environment to form mental maps, such as a sense of place and identity.

2.2 Recent Studies and Contributions

Recent studies into the themes of community participation and the creation of space offer contemporary insights into the dynamics of Talun Village. Gong et al. (2022) highlight the importance of participatory approaches in urban design, showing how involving communities leads to more responsive and inclusive spaces. This concept aligns with the participatory methods used in Talun Village, where local knowledge and cultural practices shape environmental design.

Badach et al. (2018) strongly emphasize grassroots movements and local involvement in urban planning, a concept that resonates with the participatory practices in Talun Village. Here, resident involvement ensures that designs reflect their needs and aspirations, aligning with broader trends in inclusive urbanism. Benediktsson and Lund (2010) provide insights into how residents engage with their environment, shedding light on the social dynamics and cultural practices shaping the village.

Putra and Tewdwr-Jones (2024) discuss how participatory design promotes equity by involving marginalized communities in decision-making and addressing their diverse needs and cultural values. This approach is crucial in Talun Village, ensuring that development practices are inclusive and responsive to the community's unique characteristics and needs.

This framework integrates classic community behavior theories from scholars like Rapoport and Lynch with modern participatory approaches, modeling the critical role of cultural context and community engagement in shaping the village's landscape and identity. The results illustrate how environmental design, rooted in the local population's cultural values and social practices, encourages readers to feel more connected and involved in the process, fostering a sense of community and shared identity.

3.0 Methodology

This qualitative case study explores the cultural microcosm of Talun Village using a comprehensive approach, using ethnographic fieldwork to understand daily life and cultural practices (Creswell & Poth, 2018; Yin, 2018) and combined with environment-behavior studies. The following sections detail the data collection, analysis process, and methodological justifications.

3.1 Ethnographic Fieldwork and Sampling

The study was conducted over six months (January to June 2024). A purposive sampling approach was used, selecting 15 households based on geographic distribution and architectural distinctiveness. Key participants, including village elders and community leaders, were engaged to provide insights into traditional customs. Residents were asked to share their perceptions of space, focusing on Lynch's legibility elements (path, node, landmark, edge, and district), though the researcher primarily identified these due to time limitations.

3.2 Data Collection

Data collection occurred in four stages:

- Preliminary Visits: Initial visits helped build rapport and understand the village layout.
- Ethnographic Observations: Observations of daily life and cultural activities were conducted at different times of day to capture temporal social patterns.
- Interviews: Semi-structured interviews with 15 participants focused on spatial organization, cultural practices, and environmental behavior.
- Visual Documentation: Photography and mapping were used to document key elements of the village landscape (Pink, 2007).

3.3 Data Analysis

Thematic analysis was employed to identify patterns related to cultural identity and environmental behavior (Braun & Clarke, 2006; Tuan, 2001). Rapoport's five key aspects and Lynch's principles of imageability and wayfinding guided the analysis (Lynch, 1960; Rapoport, 1977, 1990). Data triangulation was achieved by integrating observational, interview, and visual data.

3.4 Methodological Justification

Ethnography was selected for its ability to provide deep cultural insights. Visual documentation and participatory methods ensured a comprehensive exploration of the village landscape. The study acknowledges limitations, particularly the reliance on the researcher's interpretation of legibility elements, due to limited participant input.

4.0 Findings

4.1 Observation based on Rapoport's Theory

Through this theoretical approach, an environment can be built effectively if it fulfills five aspects (Rapoport, 1977). Several things were found in these aspects of the observation object. The first aspect is accepted by people and used by them. It is a function of their evaluation of its subjective appropriateness as a behavior-setting system. Talun is a small village where traditional values remain strong despite its familiarity with technological advances. The villagers adhere to traditional customs. For instance, they still dry clothes on a line in front of the house or on a rope stretched across the yard, using a pole to support the clothesline.

(a) (b)

Fig. 1. (a) Drying clothes in front of the house; (b) Drying clothes on a rope stretched across the yard.
(Source: Septian, 2024)

The second aspect is the appropriate definition of boundaries. The boundaries in the Talun Village area are comprehended. Each house has an area boundary. The side boundary is usually marked by the wall of the house itself and separated by a distance of 1-2 meters, which also serves as a trail. The front and back of the house are marked by artificial or natural fences (plants). The community respects the boundaries and avoids encroaching on areas that do not belong to them.

(a) (b)

Fig. 2. (a) Boundaries between houses; (b) Boundaries dividing area.
(Source: Septian, 2024)

The third aspect is congruence with appropriate rules. Kinship in Talun Village is strong, with daily life centered around social interaction. Villagers often socialize on house terraces with open front doors. On the one hand, they share responsibility for cleaning the common area, especially the road in front of their houses, and maintaining communal cleanliness.

(a) (b)

Fig. 3. (a) The villagers usually use the terrace to chat with neighbors; (b) Respective responsibilities in maintaining the common area.
(Source: Septian, 2024)

The fourth is the consideration of latent aspects of activities. The village still needs more parking spaces, as people prefer using vacant land for indoor spaces that generate material benefits. Meanwhile, parking lots are considered unprofitable because people pick things that must be paid for. In addition, there are rarely residents who want to manage parking lots. It leads to the habit of parking vehicles, especially motorcycles, in vacant areas. Residents often park in front of other's houses, causing resentment as it is seen as a territorial and manners violation.

(a) (b)

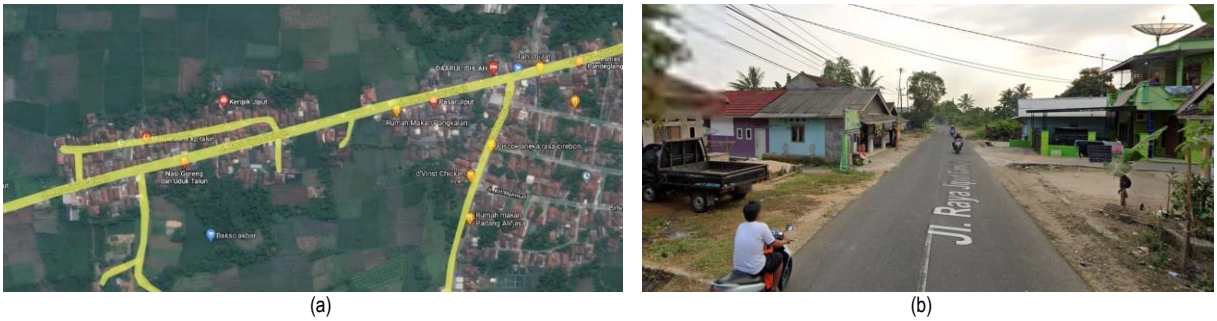
Fig. 4. (a);(b) The lack of parking spaces prompts villagers to use vacant areas as parking lots.
(Source: Septian, 2024)

The last aspect is related to other settings. Talun Village is a residential area near the market and only partially relies on it to fulfill the community's daily needs. The peddlers (who sell vegetables, side dishes, and snacks) come to the village area daily. When the peddlers come, people (specifically groups of housewives) will usually create a crowd around them. It encourages the children to play around the crowd because they like "buzz" moments.

Fig. 5. The crowd of women shopping at the peddlers encourages children to play in the surrounding area because there is a "buzz"
(Source: Septian, 2024)

4.2 Findings based on Lynch's Theory

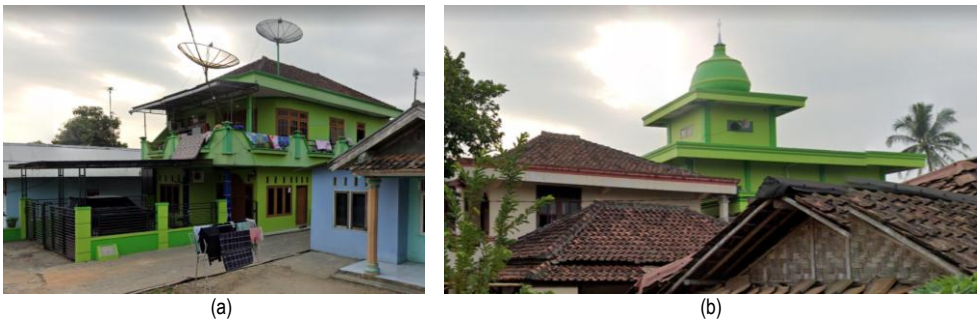
The path within the observation object is an extensive road. Small roads also provide access to houses farther away from the main road. There are still paths around the houses that give distance between houses, which can be defined as paths.



(a) (b)

Fig. 6. (a) Path of Talun Village shown on the map marked in yellow color; (b) Path in the form of a road.
(Source: Google Earth and Septian, 2024)

The area's rural nature means no large buildings or significant monuments exist. The buildings that existed were limited to houses of similar size. It causes the definition of landmark here to be aimed at houses with a different visual image than others. Large multi-story houses tend to be landmarks in Talun Village (Fig. 7a). Due to their size, these houses serve as landmarks, and their owners often hold esteemed positions in the community, making them common reference points for directions. In addition to the large houses, the mosque is also a landmark due to its sizable structure and towering dome (Fig. 7b).



(a) (b)

Fig. 7. (a) Multi-storey house and (b) Mosque are considered as a landmark due to its grand and towering shape.
(Source: Septian, 2024)

Moreover, Talun Village features extensive rice fields with clear boundaries between the houses and the fields. Typically, the rice fields are located behind the houses, separated by a river that marks the end of each area's character. Beyond the last house, the village's edge is identifiable by vacant lots of wild plants growing naturally.

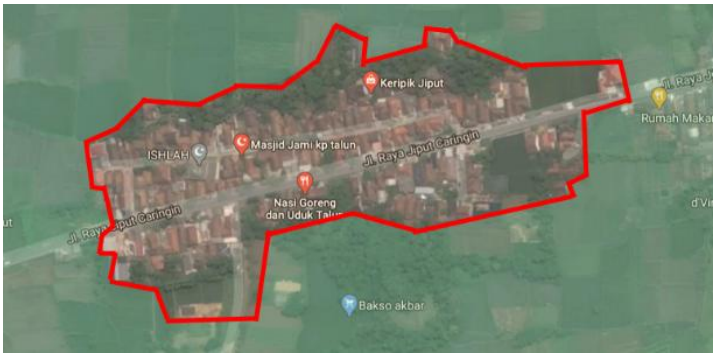


Fig. 8. The red line indicates the edge of the village area.
(Source: Google Earth, 2024)

5.0 Discussion

5.1 Discussion based on Rapoport's Theory

While considered inappropriate in big cities, using public spaces to dry clothes is widely accepted in this community. Villagers perceive these actions as favorable due to the strong neighborhood relationships and mutual support (Gong et al., 2022). The community considers this practice normal and non-disruptive, often assisting each other in managing these items during adverse weather. The shared understanding and cooperation among the residents highlight their collective acceptance and adaptation to local customs.

In Talun Village, boundaries are clearly defined and respected, ensuring harmony and order (Lynch, 1960). Each house is separated by walls and trails, with front and back yards marked by fences or plants. These physical demarcations are well understood by the

residents, who honor and avoid encroachment on others's property. This clear definition of space helps maintain a respectful coexistence and reinforces community norms regarding property rights and personal space (Benediktsson & Lund, 2010).

Strong kinship ties in Talun Village foster continuous social interaction, creating a vibrant communal life (Gong et al., 2022; Levinson, 2005). House terraces serve as communal spaces where residents gather to socialize, and open doors symbolize hospitality and openness. Despite this welcoming atmosphere, residents adhere to the rule of waiting to be invited before entering someone else's home, demonstrating a deep respect for personal boundaries. Additionally, all occupants take responsibility for cleaning the portion of the road in front of their houses, maintaining communal cleanliness, and adhering to local norms (Putra & Tewdwr-Jones, 2024). This practice keeps the village tidy and strengthens the sense of community and shared responsibility.

Parking issues in Talun Village arise from residents's preference to repurpose vacant land for profitable indoor uses rather than for parking, which is considered financially unproductive. Consequently, vehicles are often parked in unused areas or in front of neighbor's houses, irritating homeowners. This situation is aggravated by the need for more willingness to pay for parking and the scarcity of individuals willing to manage such spaces. The encroachment on private property and public spaces reflects broader challenges in balancing economic activities with communal needs and social propriety (Enarsson et al., 2024).

Despite the proximity to a market, peddlers play a crucial role in Talun Village, serving as focal points for social interaction and economic transactions. Their presence attracts groups, especially homemakers and children, creating a lively and dynamic communal environment. These sellers act as social catalysts, facilitating economic exchanges and fostering social cohesion (Enarsson et al., 2024). Their influence extends beyond their immediate economic functions, contributing significantly to the village's social fabric (Tuan, 2001). The interactions around these sellers underscore the importance of informal economic activities in sustaining community ties and enhancing social behavior.

5.2 Discussion based on Lynch's Theory

Talun Village is small and has few road intersections, with only a few significant nodes. Key nodes include the intersection that leads to more distant housing areas and one that connects the village to neighboring regions and an Islamic boarding school.

The mosque in Talun Village stands out as a significant landmark due to its height, making it visible from up to one kilometer away. This prominence makes the mosque a crucial reference point for locals and visitors, serving as a vital navigational aid and symbolizing the village (Lynch, 1960). Its towering presence reinforces its role as a central marker for spatial orientation and community identity within Talun Village (Ah Gang, 2020).

The surrounding region features distinct areas contributing to the district's diversity (Tuan, 2001). Talun Village is an organized residential area known for its vibrant social interactions and, importantly, its generally peaceful environment. The occasional lively conversations only add to the relaxed atmosphere. Adjacent to this is the rice field district, characterized by its serene, natural landscape with expansive green fields. The boarding school district also stands out due to its focus on religious values. This more exclusive area houses both permanent residents and temporary students dedicated to religious studies and is physically separated from the main residential areas of Talun Village.

6.0 Conclusion and Recommendations

This study provides a comprehensive framework for understanding the cultural microcosm of Talun Village through the integration of environment-behavior theories by Amos Rapoport and Kevin Lynch. The findings emphasize the critical importance of cultural context and community engagement in shaping the village's landscape and identity. Observations based on Rapoport's theory reveal that Talun Village effectively fulfills vital environmental aspects, demonstrating traditional solid values and clear spatial organization. Specifically, the village environment is structured around acceptance by the community, well-defined boundaries, adherence to appropriate rules, consideration of latent activities, and its relation to other settings.

Lynch's principles of imageability and wayfinding are evident in the significance of paths, landmarks, and edges within the village's spatial perception, highlighting how these elements contribute to the people's sense of place and navigation. The village's landscape, characterized by distinctive paths, landmarks, and edges, underscores the strong influence of cultural practices on spatial organization.

However, one limitation of the study is the emphasis on the researcher's interpretation of environmental legibility, as time constraints limited direct input from the villagers. This constraint may have influenced the findings related to residents' mental maps. Therefore, future research should adopt a more participatory approach to better capture the community's perspective on spatial features.

To address current challenges in the village, such as parking issues, it is recommended that communal spaces be designated for parking, with a focus on collective management and maintenance. Strengthening communal ties through increased village activities, such as festivals or community gatherings, could enhance social cohesion while preserving the community's cultural values.

Future research could involve residents more actively in defining spatial elements through participatory mapping, ensuring their perceptions are well-represented. Moreover, expanding the research to other villages with different cultural contexts would provide valuable comparative insights, enriching the understanding of how artistic practices influence environmental behavior across various settings. In conclusion, the insights gained from this research offer helpful guidance for village development and cultural value preservation.

Acknowledgments

The study was supported by a grant from the Faculty of Visual Arts and Design, Institut Seni Indonesia Yogyakarta. The support has enabled the comprehensive exploration of the culture and environment dynamics.

Paper Contribution to Related Field of Study

This paper contributes to design studies by demonstrating how cultural context shapes environmental design and human behavior. It provides insights into creating spaces that support community interactions and artistic practices, reinforcing Amos Rapoport's theory on the role of cultural variables.

References

Ah Gang, G. C. (2020). EXPLORATORY STUDY ON THE IDENTITY ORIENTATION AND SENSE OF COMMUNITY OF DUSUN BONGGI YOUTH. *Article in International Journal of Engineering and Technology*. https://doi.org/10.21172/1.162.01

Badach, J. M., Stasiak, A., & Baranowski, A. (2018). The role of urban movements in the process of local spatial planning and the development of participation mechanism. *Miscellanea Geographica*, *22*(4), 187–196. https://doi.org/10.2478/mgrsd-2018-0036

Benediktsson, K., & Lund, K. A. (2010). *Conversations With Landscape*. Ashgate.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706QP063OA
Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry & Research Design*. Sage Publication.

Ellen, R. (1986). MICROCOSM, MACROCOSM AND THE NUAULU HOUSE: CONCERNING THE REDUCTIONIST FALLACY AS APPLIED TO METAPHORICAL LEVELS. In *ANTHROPOLOGICA XXVIII*. https://about.jstor.org/terms

Enarsson, D., Hinton, J. B., & Borgström, S. (2024). Grassroots initiatives transforming cities toward post-growth futures: Insights from the collaborative economy movement in Gothenburg, Sweden. *Journal of Cleaner Production*, *441*, 140824. https://doi.org/10.1016/J.JCLEPRO.2024.140824

Gong, Z., Zhang, Z., Zhou, J., Zhou, J., & Wang, W. (2022). The Evolutionary Process and Mechanism of Cultural Landscapes: An Integrated Perspective of Landscape Ecology and Evolutionary Economic Geography. *Land*, *11*(11). https://doi.org/10.3390/land11112062

Levinson, S. C. (2005). *Introduction: The Evolution of Culture in a Microcosm*. MIT Press. https://doi.org/https://doi.org/10.7551/mitpress/2870.001.0001
Lynch, K. (1960). *The Image of The City*. MIT Press.

Pink, S. (2007). Doing Visual Ethnography. *Doing Visual Ethnography*. https://doi.org/10.4135/9780857025029

Putra, Z. D. W., & Tewdwr-Jones, M. (2024). Mind the gap: revitalizing action planning through social networks in Yogyakarta. *International Planning Studies*, *29*(1), 34–53. https://doi.org/10.1080/13563475.2023.2290469

Rapoport, A. (1977). *Human aspects of urban form: towards a man-environment approach to urban form and design*. Pergamon Press.

Rapoport, Amos. (1990). *The meaning of the built environment: a nonverbal communication approach*. University of Arizona Press.

Rosso, G. (2009). The United States as a Microcosm: Horace Kallen and the Theory of Cultural Pluralism. *RSA Journal*, *20*, 127–141.

Sun, P. (2020). Guo Zhuang: Re-Created Nature in Microcosm. *Art and Design Review*, *08*(04), 209–214. https://doi.org/10.4236/adr.2020.84016

Tuan, Y.-F. (2001). *Space & Place - The Perspective of Experience*. University of Minnesota Press. https://www.upress.umn.edu/9780816638772/space-and-place/

Yin, R. K. (2018). *Case Study Research and Applications. Sixth Edition*. Sage Publication.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

A Phenomenological Expressionist Approach to Mixed Media Painting

Wang Yunlong[1,2], Mohd Fuad Md Arif[1*], Zhang Ziyi[1], Yang Zifan[1]
**Corresponding Author*

[1] Faculty of Creative Arts, Universiti Teknologi MARA, Selangor, Malaysia
[2] Beihai University of Art and Design, Beihai City, Guangxi Zhuang Autonomous Region, China

wangyunlong2022@gmail.com, fuad5649@uitm.edu.my, 2022862092@student.uitm.edu.my, q416983017@163.com
Tel: +60 176531488

Abstract
Phenomenological expressionism enables people to be true to their experiential reality in their creation. It has great potential, but its application in mixed-media painting is limited. This study aims to clarify the relationship between phenomenological expressionism and mixed-media painting. Art practice-based research explores the role of composite waste materials in painting. Incorporating recycled old materials into mixed media painting can enrich the expression of painting. The effectiveness of phenomenological expressionism in artistic creation and theoretical research is verified, providing new insights for artists in creative practice and environmental protection.

Keywords: Phenomenological expressionism; mixed material painting; art practice-based research; waste materials
eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6173

1.0 Introduction

Phenomenological expressionism is a concept proposed by contemporary American artist O’ Neill Cushman in 2015. He focuses on painting after the visible world. It is based on the principles of phenomenology and provides artists with a unique perspective to remain true to empirical reality in their artistic creation.Phenomenology was originally an important school of modern philosophy, but it closely interacts with contemporary painting. This is because phenomenology has spread to a wide range of multidisciplinary fields, such as philosophy and painting, making phenomenology have a distinct interdisciplinary nature. (Gao, 2009). Suppose people want to discuss the direct relationship between phenomenology and mixed-media painting. In that case, they need to refer to expressionism (Fellmann, 1982), because expressionism pursues established objects, supports any possible assumptions, and thus liberates the nature of the object from accidental reality. Through the connection between expressionism and phenomenology, painting has a certain tendency toward abstraction. The phenomenological expressionism they formed has a relationship with plastic arts, and there are also studies aimed at establishing the relationship between the structure of phenomenological expressionism and other types of environmental art.

Art practice-based research has found that various composite waste materials also play an important role in painting in addition to traditional forms of painting. With so many waste materials available, artists are reminded to explore more possibilities for the secondary use of recyclable materials.

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6173

The contemporary art practice guided by phenomenological expressionism is derived from personal experience, and its expression is more real and can establish a deeper connection with the audience. It encourages reflection on contemporary social and environmental issues. Through works, it criticizes consumerism, environmental degradation and other issues in modern life, and arouses public attention to sustainable development. Phenomenological expressionism and mixed media painting are two disciplines that have a sure internal consistency. Interdisciplinary art practice research will present different trends. Its research objective is to explore the positive impact of phenomenological expressionism on painting creation and sustainable development, and bring more possibilities for artistic creation and the dissemination of environmental awareness.

2.0 Literature Review

When studying phenomenological expressionism, the influence of different cultural and social backgrounds on artistic creation has not been considered, which limits its applicability in the global art context. This study partially practices from the perspective of Chinese regional culture and materials to expand its scope of application. The specific practice and theoretical combination of phenomenological expressionism in the field of environmental sustainability has not yet begun, and the research on its specific application in mixed media painting is also limited. There is a lack of systematic case analysis in the use of sustainable materials. The researcher supplemented the research gap through literature collection and artistic practice.

2.1 Phenomenological Expressionism

O'Neill Cushman has proposed phenomenological expressionism, which originates from phenomenology and is an extension of phenomenology. Phenomenology is an essential philosophical trend that spread across Europe in the twentieth century (Xu & Hao, 2023). Husserl understood phenomenology to be an experience that captures its primordial origins or essence without interpretation or theorizing (Husserl, 2001). Phenomenology, broadly defined, is primarily a system of philosophical theories that apply phenomenological principles and methodology to other disciplines. Heidegger defined phenomenology as "letting what shows itself be seen in the way it shows itself" (Heidegger, 2010).

The expressionist painting focuses on the expression of the artist's inner feelings, in contrast to the neglect of the external form of the object copying; expressionist artists require themselves to break through the shackles of the appearance of things in the painting and highlight the inner nature of the motivation of their paintings is a spontaneous release of spiritual power (Q. Chen, 2022).

O 'Neill Cushman is an American artist living and working in Aix-en-Provence, France. His work is centered around the idea that works of art are structurally parallel to nature and that the most direct form of self-expression is the phenomenological study of these natural structures. His methodical and constant search for poetic truth and perceptive meaning in nature and his work is the guiding principle of his rapid, intuitive style, which he calls phenomenological expressionism. According to O'Neil Cushman (Cushman, 2015) , phenomenal expressionism is a good starting point; the artist is faithful to his own experience and not to the understanding of others, and if he is faithful to his creation, he will paint a complete and dynamic picture throughout, presenting the perceptual part of his encounter with the world.

Phenomenology is a research process or philosophical endeavor, whereas phenomenological expressionism involves the creation of works of art. Artists, like philosophers, are very concerned with truth, but artists sometimes have to alter factual truths to approach emotional or perceptual truths. This is achieved, for example, through abstraction or exaggerated art. In this way, the form of the work is different. So, the result of phenomenological expressionism is a work of art, and the form of a work of art is an expression.

Phenomenological expressionism focuses on individual perceptions and emotions towards the world, expressing these inner experiences through artworks. The artistic creation of phenomenological expressionism combined with environmental concepts involves choosing sustainable materials for creation. Artists can use waste materials and recycled resources when expressing emotions and perceptions, giving these materials new life and value through creative transformation and artistic expression.

2.2 Mixed Media Painting

Mixed media painting refers to easel painting that includes, but is not limited to, traditional painting materials. "Mixed" refers to the variety and non-limitation of painting materials that the author can choose (Chen, 2018).

Fusing multiple painting genres is conducive to transforming artistic concepts and expanding materials and language skills. This fusion blurs the boundaries between multiple painting genres, allowing the works to show the interpenetration and evolution of diversified art forms from the East and the West, giving more vitality to contemporary art expression (Zhang, 2020). The material paints incorporate media materials as an independent language into the language system of painting expression, and the diversity and uncertainty of the choice of materials and forms of expression opens up unlimited space for the exploration of the language forms of plastic arts in the future (Wang & Liang, 2020).

Different types of mixed media painting:

a. Rubbing and conversion： Traditional rubbing takes calligraphy stele and ancient picture brick as extension bodies (objects to be printed), and the leading media used are rice paper and ink and wash (Zhang, 2007).

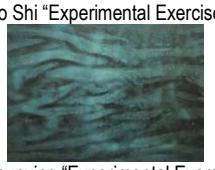
b. Colored bottom： "Colored bottom" removes the "content image" that usually appears in the picture, and the picture appears most simply and concisely and tends to be a pure abstract work.

c. Texture： Texture exists in nature and People's Daily lives, from the natural rocks, land, and trees to human industrial products such as metal, leather, wood, and other substances that have their texture beauty.

d. Collage and composition： The liberation of the traditional understanding of space and shape gradually shifts people's attention from the three-dimensional space and the light and shadow volume of objects in the picture to the composition of the picture's point, line, and plane.

e. Drawing by the white method： Based on a colored bottom, white from the bright part of the shape, repeatedly lifting multiple layers of white as far as possible to retain the transparent layer and colored bottom.

Table 1. Classification of materials for mixed media painting

Typology	Materials	Supporting image
Rubbing and conversion	Inks, toners, acrylics, waxes, watercolors, mineral pigments, spray paints, and a wide range of professional papers and other materials.	Gao Shi “Experimental Exercises”
Coloured bottom	Color powders, mordants, glues, oils, waxes, and texturing aids.	 Hu Chunying “Experimental Exercises”
Texture	Plasticine paste, clay, sand, various paper types, cloth, and natural objects.	Song Xuezhi “Experimental Exercises”
Collage and composition	Newspapers, posters, linen, linen, clothes, readymade products, etc. Screen printing, photography, digital, and computer intervention.	Zhang Yuan “Experimental Exercises”
Sketch the white method	Tempera, acrylic paints, oil paints, toners, color powders, etc.	Yang Jie “Human Body”

(Source: Adapted from Zhang Yuan, 2007)

3.0 Methodology

The research methodology was a background survey of literature related to phenomenological expressionism and mixed-media painting. To analyze research based on mixed media painting practice through phenomenological expressionism. In addition to the literature analysis, this study uses art practice-based research, which focuses on discovering the nature of practice and is known as 'art practice-based research', carried out by practitioners such as artists, designers, curators, writers, musicians, teachers, and others. This type of research generates new concepts and methods for producing original knowledge (Candy, 2006). However, the aim is not practice; it is to use practice as an aid, and the ultimate aim is to do theoretical research.

Art practice-based research is a form of original inquiry that aims to gain new knowledge through practice and practical outcomes. The originality of claims and their contribution to knowledge can be demonstrated through creative outcomes. The main focus here is on the study of mixed-media painting practices. Although the meaning and context of the claim can be described in words, a complete understanding can only be gained by direct reference to these painting outcomes.

The creative procedures followed in mixed media painting include: finding research objects, observing painting objects, selecting materials corresponding to the cultural background, not restricting specific outlines, exaggerating material performance, showing the vitality of materials, and spreading environmental awareness to the audience. Art theoretical research draws on practice, as practice can open up more possibilities for new creations, and these interdisciplinary practices are shaping a unique artistic language (Thuc, 2022).

4.0 Findings

Through practical experience, it is found that the application of phenomenological expressionism makes the process of mixed media painting practice clearer, which is conducive to further innovation of mixed media painting research (Jasmi & Mohamad, 2016). It has been established that phenomenological expressionism plays essential roles in the following manner, namely：

Adjusting the way of observing drawing;

Rational selection of waste materials;

Breakthroughs in innovative types of drawing;

Optimize the use of drawing language.

Through these aspects, the researcher develops a specific analysis of the role of phenomenological expressionism:

Phenomenological expressionism's way of seeing is a subjective way of looking at paintings, which prompts us to search for objects of pictorial expression subjectively. Observing the painted object, the geometric perspective common in art since the Renaissance, reduces the visual world to a static monocular presentation, imitating the camera rather than offering an equivalent to human perception. Merlo-Ponty rejects this "scientific thinking", saying that people must go back to what existed before it, to the field, to the earth, to the sensuous, humanly transformed world of our lives and bodies. If one abandons the notion of geometric space when viewing scenes and objects and starts from self-perception, phenomenological expressionism. In this way, one can avoid prejudice against different works and perceive them "expressively" (Symons, 2014).

The process of making material choices should also start with self-awareness. Choose materials corresponding to your cultural background, such as bamboo, rice paper, ink, and silk in Chinese culture. Choose materials that correspond to your environment, such as sand and soil in desert areas, grass and trees in tropical rainforests, and original or readymade electronic products in busy cities. Choose waste materials you see daily, such as paper, canvas, plastic, or clay.

In mixed media painting, there is no pre-determined silhouette, preserving the possibility of "mistakes" in the picture, which may end up being the most exciting part of the painting. The artist does not limit the work; it grows organically (Cushman, 2015). Therefore, there is a natural connection between the uncertainty of mixed media painting and the phenomenological expressionist orientation, which makes the work always produce something new.

In phenomenal expressionism, the artist prefers to paint directly from materials rather than prepared drawings. This may be because drawing tends to be figurative, which has been the preferred mode of Western art since the 17th century (Symons, 2014). The artist tries to overthrow this traditional model and instead uses different materials, lines, and colors to evoke the image together. Using mixed media to create volume, people experience the depth and solidity of objects in phenomenological expressionism. In mixed-media painting, the artist can exaggerate the colors while retaining the form (Symons, 2014).

5.0 Discussion

Mixed media painting research is very similar to the theory of phenomenological expressionism, as they both adopt a series of aesthetic strategies to concretize the subjective consciousness and thus facilitate the process of emotional identification between the artist and the viewer (Matthews & Anderson, 2010).

Most of the paper and cloth used here are recycled waste from readymade products. Sand is the leftover of building materials, and clay is sculpture mud that is recycled and reused after the sculpture is damaged. It is essential that painting transcends various media and directly appeals to the senses, which makes the creation of mixed media paintings made of waste materials provide higher visual and sensory value for the public aesthetic. O'Neill Cushman's phenomenological expressionism theory explores the ability to promote the integration of different old media into painting from a unique theoretical perspective, providing a theoretical basis for confirming the effectiveness of research based on artistic practice.

The following works are analyzed to illustrate how this research can be applied in art practice:

Fig.1. Wuzhou Fugue, 200×400cm (Source: Wang, 2018, Copyright Consent: Permissible to Publish)

Figure 1：Merleau-Ponty emphasizes the importance of perception in constructing the world and believes that our perception is generated through the interaction between the body and the world. The work transforms the researcher's perception and experience of familiar everyday objects into an artistic expression using waste objects such as old shadow puppets, secondary pulp, worn-out linen, and colored cloth strips. These materials themselves carry traces of time and a history of use. Merleau-Ponty believes that the body is the core of our interaction with the world. Through the body's movements and perceptions, people experience and understand the world. In the creation process of this work, the researcher transformed waste objects into artistic materials through practical operations of the body, such as selection, soaking, hammering, pasting, and sewing. This interaction between the body and the material is a technical operation and a deep dialogue between the individual and the material. The work takes the landmark buildings of Jinhua City, such as the Bayong Tower, the Wanfo Pagoda, and the Wu Opera House, as the main body to express the researcher's initial perception of familiar scenes. This perception is transformed and reconstructed through the researcher's subjective consciousness, breaking the cognition of the inherent form of the building and reconstructing the city's appearance in mind with new shapes and colors. The work uses discarded items for secondary creation, showing creativity and sensitivity to materials and conveying the concept of sustainable development. This creative method not only extends the life of the items but also spreads environmental awareness through art and reflects respect for natural resources.

Fig.2. Thinking, 60×80cm (Source: Wang, 2019, Copyright Consent: Permissible to Publish)

Figure 2：Phenomenology emphasizes the concept of "life world", which refers to the experience and perception of individuals in daily life. The work uses the old table in the researcher's home as the main object, reflecting the researcher's perception and understanding of childhood life memories. In the creative process, the researcher re-examined and used waste materials, removing the judgment of these items' original function and value and focusing on their texture, form, and color. It focuses on the role of temporality and memory in individual experience. The waste of rice paper, old gauze, and leaves in the work carry the traces of time and the history of use. Through painting creation, viewers can experience the new meaning of these materials, thereby generating thoughts and resonances on environmental protection and sustainable development.

Fig.3. The Paper Journey to the West, 60×80cm (Source: Wang, 2020, Copyright Consent: Permissible to Publish)

Figure 3：Intentionality in Husserl's phenomenological concept means that consciousness always points to an object; that is, every experience is about something. The researcher chose old rice paper, screen nets, discarded printing paper, banana water, and watercolor paint. These materials are physical choices and the concrete expression of the researcher's inner intentions and emotions. The work is based on the characters and stories in "Journey to the West," especially the classic plot "Havoc in Heaven." "Journey to the West", one of China's four great masterpieces, is a literary work and an essential memory of many people's childhood. By re-interpreting this classic story, the researcher expresses his admiration for the protagonist, Sun Wukong, and his deep cognition in his heart. The viewer also feels an emotional projection through the work. Choosing old rice paper, old screen nets, and discarded printing paper as materials gives these everyday waste items in life new artistic value. This reflects sustainable development and expresses nostalgia and cherishment for old things by reusing materials.

Fig.4. Breathe, 60×80cm (Source: Wang, 2022, Copyright Consent: Permissible to Publish)

Figure 4：Phenomenological expressionism focuses on expressing and exploring inner perceptions and experiences through art.

In this work, the researcher used waste materials to present an unconscious creative process through the flow and interaction between dripping glue, varnish, and pigment. This method not only reveals the nature and characteristics of the material but also expresses the exploration of perception and experience through art. The work has no fixed cognition and meaning but presents different results and feelings through the perception and experience of the audience. This work appears to be a case in teaching. Showing the reuse of waste materials intuitively shows students how to recycle waste materials for multiple mixed-media painting creations. These materials have a unique value in artistic creation and play a vital demonstration role in teaching and spreading the concept of environmental protection.

Articles on O'Neill Cushman and Andrew W Symons and researchers' mixed media painting research on waste materials constitute the background of artistic practice cases to demonstrate the material vitality of painting and objectively promote the dissemination of environmental awareness. Research shows that the perception of phenomenological expressionism is closely related to the sensory texture of waste materials used in the mixed media painting research discussed (Sarkar & Blaney, 2023).

Maurice Merleau-Ponty described phenomenology as "the study of essences" (Merleau-Ponty, 2012). In the future, with the influence of more official exhibitions of waste materials, more diverse environmental policies can be promoted through interactions between works, audiences and environmental protection departments.

6.0 Conclusion and Recommendations

Pursuing poetic truth in perception is the carrier of creating works of art, and the work of art is a living whole. The practice of painting with discarded materials is a research method. Phenomenological expressionism gives this method some significance for sustainable development. Through material art, people can understand how to maintain the environment and ecological balance, recognize different environmentally friendly materials in life, feel the health and vitality of life, and protect the world with heart. From this environmental protection perspective, people can better understand the intention of creation.

Mixed media painting represents art practice and summarizes the advantages of art practice-based research. Finally, phenomenological expressionism can be used as a conceptual framework for undertaking art practice-based research, and it can also provide potential uses in promoting social and environmental sustainable development.

The research also has certain limitations. When exploring sustainable materials, the research often focuses on the materials themselves, while ignoring the comprehensive effects of environmental impact and social and cultural background on artistic creation. In the future, diversified art works analysis should be conducted to cover different cultural and social backgrounds to enhance the universality and applicability of the research. The future research direction is how phenomenological expressionism can be used as a tool for social criticism to promote public attention and reflection on environmental and social issues.

Paper Contribution to Related Field of Study

It provides guidance for artists on the use of sustainable materials, helps them integrate environmental awareness into their creations, and promotes more ecologically responsible artistic practices. It also provides new sustainable development concepts for theoretical scholars and environmental organizations.

References

Candy, L. (2006). Practice-based Research: A Guide. *Creativity and Cognition Studios Report*, V1.

Chen, J. (2018). Research on the humanistic value of contemporary Chinese comprehensive material painting. *Art Panorama (11)*, 58-59.

Chen, Q. (2022). Talking about the mutual influence between Western expressionist painting and Chinese freehand painting. *Appreciation of Masterpieces (02)*, 179-181.

Cushman, O. (2015). *Phenomenological expressionism*. Contemporary Perceptual Art. https://doi.org/https://www.oneillcushman.com/phenomenological-expressionism

Fellmann, F. (1982). Phenomenology and Expressionism (Phänomenologie und Expressionismus).

Gao, X. (2009). *Basic Issues in the Phenomenology of Art*. https://doi.org/https://philosophy.sysu.edu.cn/phaenomenologie/xzzl/xzgxy/3611.htm

Heidegger, M. (2010). *Being and time*. SUNY press.

Husserl, E. (2001). Logical Investigations Volume 2.

Jasmi, M. F., & Mohamad, N. H. N. (2016). Roles of public art in Malaysian urban landscape towards improving quality of life: Between aesthetic and functional value. *Procedia-Social and Behavioral Sciences*, *222*, 872-880.

Matthews, P., & Anderson, S. (2010). S06-02-Cinema, subjectivity and psychosis: towards a phenomenological approach. *European Psychiatry*, *25*(S1), 25-E72.

Merleau-Ponty, M. (2012). Eye and mind. In *Theatre and Performance Design* (pp. 243-245). Routledge.

Sarkar, A., & Blaney, A. (2023). Material Metaphor and Reflexivity in Contemporary Painting: A Practice-based Investigation. *Journal of Aesthetic Education*, *57*(1), 98-119.

Symons, A. W. (2014). *A Phenomenological Approach to Chaïm Soutine's Portaits* (Doctoral dissertation, University of London (Courtauld Institute of Art)).

Thuc, C. H. (2022). *Based Art Practices in Southeast Asia*. Palgrave Macmillan, Cham.

Wang, S. Q., & Liang, C. Z. (2020). Research on the practical methodology of comprehensive material painting. *Art Work (04)*, 40-42.

Xu, M., & Hao, Y. (2023). The enlightenment of phenomenological methodology to art education. In *Proceedings of the 2023 First Academic Forum on Teacher Education Research* (pp. 605-607). Xi'an Conservatory of Music. https://doi.org/10.26914/c.cnkihy.2023.028835

Zhang, Y. (2007). Material spirit. In Z. Yuan (Ed.), *Oil Painting Course,The Materials Art Studio* (p. 13). Peking University Press.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

From Industrial Waste to Art: Innovative applications of jun porcelain waste in sustainable environmental design

Lai Huasheng[1], Siti Suhaily S.[1]*, Deng Weibin[2], Sun Xiaoli[1]

**Corresponding Author*

[1] Product Design Department, School of the Arts, Universiti Sains Malaysia, Penang, Malaysia
[2] School of Design, Yango University, Fu'zhou, PR China

watsonart@163.com, suhaily@usm.my, 418020112@qq.com, sunxiaolisq1216@163.com
Tel: +601167645389

Abstract

Amid global emphasis on sustainability, the traditional ceramic industry faces high energy consumption and waste management challenges. This study explores transforming Jun Ware waste into practical and artistic design elements. The research highlights traditional processing issues by analyzing its sources and physicochemical properties and proposes innovative integration into modern design. This approach aims to reduce pollution, conserve resources, and enhance cultural significance. Applications include urban public spaces, landscape design, urban sculptures, murals, and installation art, thereby giving new life and value to Jun Ware waste.

Keywords: Jun Ware; environmental protection; waste utilization; design

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6174

1.0 Introduction

Sustainable development is a focus of attention in countries all over the world, affecting not only current economic development but also the living environment of future generations. With rapid industrialization and modernization, the demand for resources has soared, leading to problems such as environmental pollution, ecological damage, and climate change(Tang, E., 2022). The traditional Jun porcelain industry, especially the high-end Jun kiln industry, has long been characterized by high energy consumption and severe pollution. Its production process consumes much energy and produces a lot of waste and air pollution. The main waste products of Jun porcelain include defective porcelain, sludge, and slag. If not properly treated, these wastes can cause large areas of land to become barren and cause severe pollution to the soil, water bodies, and the atmosphere. Jun porcelain waste is a typical type, and its value in environmentally friendly design is gradually being recognized and discovered. This project aims to provide new material resources for the green development of China's Jun porcelain industry through the sustainable use of Jun porcelain waste. The research on the physical and chemical characteristics of Jun porcelain waste and its applicability in design lays the foundation for the application of Jun porcelain waste in environmental protection(Wu, Z., 2023). Design schemes and application cases of Jun porcelain waste are analyzed

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6174

and studied. Based on a complete understanding of the properties of waste Jun porcelain materials, the application possibilities of waste Jun porcelain materials in various environmental protection scenarios are explored using modern design ideas and methods.

2.0 Literature Review

In existing research, international scholars have explored the application of waste in new building materials. The emphasis is on minimizing the effect on the environment throughout the entire life cycle, from the selection of raw materials, the production process, and use to final waste disposal. Researchers have recently developed various methods to improve ceramic waste's recovery rate and quality (Chen, L., 2024). For example, it can be converted into reusable particles through pyrolysis or mechanical crushing. Some organizations have organized various activities for participants to experience the creative transformation of ceramic waste first-hand, promoting the inheritance and development of traditional culture. Zhang et al. (2023) discussed the application of ceramic waste in the manufacture of sustainable concrete, emphasizing the pozzolanic activity of ceramic waste and its potential to improve the performance of concrete. Gol et al. (2023) investigated the application of roof tile waste in the formulation of ceramic glazes. They evaluated waste's effect on ceramic glazes' performance through chemical analysis and surface hardness tests. Zaharie et al. (2022) explored the application of ceramic waste in the building materials industry, particularly as an alternative material for new gypsum mortars. The research validated the potential of ceramic waste in reducing the consumption of natural resources and promoting waste recycling through experimental verification. These studies explore the innovative application of industrial waste from different perspectives and demonstrate its great potential in environmental protection and sustainable development. Most of the research has certain limitations, and interdisciplinary cooperation and the application of comprehensive research methods still need to be improved, resulting in a single research perspective and making it difficult to solve the complex problems of transforming and utilizing ceramic waste (Liu, X., 2024). In addition, the connection between policy research and practical technology application needs to be closer, resulting in policy recommendations that lack practical operability.

3.0 Methodology

To ensure the depth and breadth of the research, this project will employ a combination of qualitative and quantitative research methods. The qualitative approach will include case analysis and literature review to analyze and summarize Jun porcelain waste's development prospects in art design. We will use quantitative methods to evaluate the waste's physicochemical properties(Wu, Z., 2023). This will include an experimental design to quantify properties such as water absorption, compressive strength, and the chemical composition of the waste. The research will encompass the treatment of waste materials, performance testing, and practical application evaluation. This comprehensive approach will reveal the waste materials' potential utilization value and limitations(Chen, L., 2024). We will systematically study Jun porcelain waste to gain a deeper understanding of its characteristics and utilization prospects. This will provide a theoretical basis for designing Jun porcelain waste, aiming to inform future applications and innovations in the field.

4.0 Findings

4.1 Physical Properties of Jun Porcelain Waste

4.1.1 Testing Physical Parameters Such as Density, Hardness, and Water Absorption of Jun Porcelain Fragments

To test their physical properties, the author collected 8 Jun porcelain samples of different colors and glazes from various factories and kilns (Wu, Z., 2023). These tests provided relevant data. The fundamental physical parameters of Jun porcelain fragments include density and hardness (Lu, X., 2021). Density is a core indicator for evaluating the quality of solid waste, while hardness is crucial for assessing the wear resistance of solid waste. Accurate testing can determine its suitability for specific purposes, such as a lightweight filler for low-density waste or durable decorative materials for high-hardness waste (Han, F., 2021). The following are the test results for the physical properties of the Jun Porcelain Fragment Samples.

Table 1: Test Results of Physicochemical Properties of Jun Porcelain Fragment Samples

Number/test category	Thermal shock resistance	Water absorption	Dissolution of lead and cadmium		Flexural strength(MPa)	Hardness (H_v)	Density(g/cm³)
			Lead (mg/L)	Cadmium(mg/L)			
A	crack	1.0%	2.0	0.3	120	4	2.7
B	NO crack	2.0%	1.0	0.3	100	4	3.0
C	NO crack	2.0%	1.5	0.25	120	5	2.9
D	NO crack	1.0%	1.5	0.3	100	4	2.6
E	NO crack	1.0%	2.0	0.25	150	6	3.1
F	crack	1.0%	1.0	0.25	110	4	2.8
G	NO crack	2.0%	1.5	0.3	150	5	2.9
H	NO crack	1.0%	2.0	0.3	160	6	3.2

(Source: Author, 2024)

Testing the physical properties of Jun porcelain fragments revealed excellent flexural strength, thermal shock resistance, and hardness (Zhang, Y., 2023). The fragments' flexural strengths consistently exceeded 100 MPa, indicating reliable performance and durability during daily display and use. The thermal shock resistance of the porcelain fragments was also favorable, with most pieces enduring high-temperature tests and rapid cooling without cracking, making them suitable for extreme weather changes or high-temperature conditions. The fragments had a reasonable water absorption rate, mostly below 2%, and a relatively high density of around 3.0 g/cm³, making them suitable as decorative filler materials. High water absorption rates make these materials ideal for decorative floor tiles, landscape design elements, ceramic grinding tools, and soil conditioners (Wang, L., 2023). Specifically, water treatment materials serve as filtration media in water treatment systems, efficiently eliminating suspended solids and pollutants to enhance water quality (Li, F., 2024). The lead and chromium leaching tests for Jun porcelain fragments were satisfactory, with levels within acceptable limits and meeting environmental standards. Samples A and D are classified as low-density waste and are suitable for use as lightweight fillers. In contrast, samples B, E, and H are classified as high-hardness waste and are suitable for manufacturing durable decorative materials.

4.1.2 Plasticity and Renewability of Waste Materials

In recent years, the aesthetic concepts of Jun porcelain have undergone significant changes, expanding from indoor decorative art to outdoor applications (Guo, S., 2018). Currently, the innovative reuse of Jun porcelain waste is a crucial topic. Artists, with their unique artistic vision, seamlessly integrate the texture, color, and other characteristics of Jun porcelain into their works, inspiring public imagination and promoting the sustainable development of modern Jun porcelain art. Artists can more deeply express their inner feelings and appreciate these works from different perspectives with Jun porcelain (Li et al., 2024). Recycling waste is a significant challenge due to its inherent characteristics, which often impose limitations. It cannot follow a fixed model and must adapt flexibly based on the waste's properties. Standard treatment methods include repairing with discarded gold lacquer, drilling and combining, reshaping after breaking, and adding various auxiliary materials to create new forms.

In Wang Ximeng's "A Thousand Miles of Rivers and Mountains," a lovely landscape painting, the artist sourced Jun porcelain waste materials from regions such as Yuzhou in Henan. He selected porcelain pieces of various colors and labeled them accordingly. Using unique restoration and gold-building techniques, he organically integrated these pieces. The final creation presents the distinctive scenery of "A Thousand Miles of Rivers and Mountains," depicting continuous mountain ranges, vast rivers, and tranquil villages. The painting is dense with boat shadows, vibrant colors, distinct mountain shapes, and rich, varied lines. The structure is clear, and the rhythm is dynamic and measured. These small, carefully pieced-together fragments form a unique sense of rhythm, with each turn encapsulating the flow of mountains and rivers (Chen, L., 2024). Using green and earthy yellow fragments, chosen for their resemblance to natural landscapes, Wang aimed to create a gradient of green tones. Despite the subtle differences between individual parts, they collectively produce a sense of visual depth and rhythm, with alternating distances and varying heights. "Heavy Mountains" creatively uses Jun porcelain waste and incorporates Dongyang wood carving, a constituent of Jiangnan culture, into its creation process.

Fig 1: Jun Porcelain Waste Artwork "Heavy Mountains"
(Source: Photograph from various artist's studios, 2024)

4.2 Chemical Properties of Jun Porcelain Fragments

4.2.1 Composition Analysis of Waste Porcelain Fragments

Chemical composition tests were conducted on the Jun porcelain fragment samples to assess their chemical stability, safety, environmental compatibility, weather resistance, and slip resistance(Hao et al., 2023). The chemical stability of these fragments is primarily attributed to the silicates and oxides that constitute these inorganic non-metallic compounds, which maintain their stability in high-temperature environments. Safety is ensured by the absence of heavy metals or other potentially toxic elements within safe standards(Peng et al., 2022). This is particularly important for materials used in public urban spaces, where Jun porcelain fragments, such as walkway bricks and landscape walls, frequently come into contact with people. Studying the chemical composition of Jun porcelain waste is crucial for understanding its chemical properties. Analyzing the waste's main components, like silicon, aluminum, and iron, evaluates its chemical stability and potential reactivity. These data are critical for determining the suitability of the waste in various applications. The following table presents the chemical composition test results of eight Jun porcelain fragment samples.

Table 2.Chemical Composition Test Results of Jun Porcelain Fragment Samples

Number/ composition	SiO2	Al2O3	CaO	MgO	K2O	Na2O	Fe2O3	TiO2	CuO	ZnO	SnO2
A	66.16	18.62	0.65	1.26	1.87	1.98	0.18	0 .00	2.34	0 .00	5.18
B	71.26	17.72	1.31	1.56	0.78	1.40	0.38	0.00	0.69	0 .00	4.30
C	61.01	16.23	3.18	1.06	3.23	3.75	0.38	0.00	3.85	0 .00	6.26
D	70.14	16.19	1.02	1.53	0.85	2.04	0.35	0.00	0.67	0 .00	5.69
E	68.26	19.10	1.54	1.70	0.62	0.60	0.62	0.02	0.52	0 .00	6.80
F	68.10	18.60	0.35	1.36	0.34	2.50	1.76	0.01	0.05	0 .00	5.90
G	62.28	16.81	3.54	0.85	2.46	3.21	0.63	0.00	3.52	0 .00	4.41
H	64.31	18.80	3.31	1.06	1.02	2.36	0.26	0.01	1.53	0 .00	4.82

(Source: Author, 2024)

The test results analysis shows that samples A-H of the porcelain fragments have the highest content of SiO_2 and Al_2O_3, with SiO_2 exceeding 60% and Al_2O_3 exceeding 16%. The chemical composition of the glaze and porcelain body determines the chemical stability of the Jun porcelain fragments. The primary components, SiO_2 and Al_2O_3, ensure the excellent chemical stability of Jun porcelain. SiO_2 forms a stable glass structure, reducing the probability of chemical reactions in the material. The presence of Na_2O and K_2O in the Jun porcelain fragments lowers the melting point of the glaze, making the material more compact and further enhancing its chemical stability(Li et al., 2024). The fragments also contain Fe_2O_3 and CuO, which act as colorants and react with other chemical components to form a stable glaze color, indirectly enhancing the chemical stability of Jun porcelain. The high content of SiO2 and Al2O3 in the fragments endows them with excellent weather resistance, allowing them to withstand temperature changes, humidity, and ultraviolet rays. CaO and MgO in the fragments contribute to weather resistance by forming stable crystalline phases with silica, enhancing the glaze's resistance to weathering. Jun porcelain fragments' smooth and dense glaze surface prevents moisture and pollutants from penetrating, maintaining their appearance and performance in long-term outdoor use, which is especially important for applications in public urban spaces. The chemical composition analysis indicates that Jun porcelain fragments possess excellent wear resistance, determined by the body composition and sintering degree(Zhang, Y., 2023). The transformation of $Al_2Si_2O_5(OH)_4$ in the ceramic body into mullite ($Al_2Si_2O_7$) at high temperatures imparts high hardness and wear resistance. The SiO_2 component in the fragments also enhances wear resistance, preventing the material from breaking easily under external forces. The chemical composition of Jun porcelain fragments determines their chemical stability, weather resistance, and wear resistance, ensuring their long-term application and preservation in public spaces.

4.2.2 Role of Chemical Properties in Design

The chemical properties of Jun porcelain fragments directly affect their reutilization. The kiln transformation of Jun porcelain during firing causes various chemical reactions, enriching the glaze color and enhancing the feasibility of redesigning waste fragments(Liu, X., 2024). Different glaze compositions can produce various glaze structures, allowing designers to create diverse artworks based on the effects of different glazes. The chemical properties of Jun porcelain also influence the environmental adaptability of artistic works, such as the durability and corrosion resistance of the fragments. Excellent corrosion resistance allows waste materials to serve as acid and alkali-resistant decorative materials, while certain properties may limit their use in specific environments. Understanding these characteristics helps designers correctly select waste materials and predict their applications.

4.3 Application of Waste Jun Porcelain Fragments in Design

4.3.1 Application in Urban Public Spaces

Research and exploration of the repeated reutilization of waste porcelain fragments have shown that these fragments can be transformed into artistic pavement materials and decorative elements(Cai, C., 2020). These materials are aesthetically pleasing and durable, adding cultural richness to urban environments and conveying the ideas of environmental protection and sustainable design. When utilizing waste porcelain fragments, their environmental performance must be considered, ensuring they do not contain heavy metals and possess good wear resistance, flexural strength, and hardness.

4.3.2 Application in Landscape and Garden Decoration

Utilizing the natural colors and textures of Jun porcelain waste, it can be incorporated into landscape design to create unique rockeries, water features, and other elements(Ren, X., 2023). Reusing waste materials enhances the natural beauty of gardens, conserves resources, and shows respect for the environment.

4.3.3 Application in Urban Sculptures, Murals, and Art Installations

Recycling Jun porcelain waste is an innovative material choice and a form of environmental protection in urban sculptures, murals, and art installations. By utilizing the waste materials' unique texture and color, these artworks can embody rich cultural heritage and contemporary aesthetics, transforming waste into culturally significant and modern artistic creations(Cheng, Z., 2021).

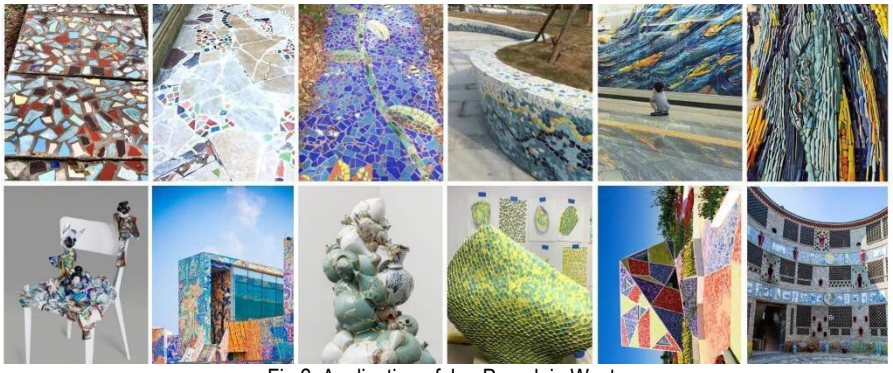


Fig 2: Application of Jun Porcelain Waste
(Source: Photograph from various artist's studios, 2024)

5.0 Discussion

Jun porcelain shards have been tested for their physical and chemical performance and have been found to have reliable performance, durability, and environmental friendliness. Their good thermal shock resistance means that most shards will not crack after being tested at high temperatures and then rapidly cooled, making them suitable for use in extreme weather or high-temperature conditions—tests for the dissolution of lead and cadmium show that Jun porcelain shards have an acceptable environmental performance. Chemical composition tests have shown that the main chemical components of Jun porcelain shards are SiO_2, Al_2O_3, $Al_2Si_2O_7$, Fe_2O_3, and CuO, which give them high hardness and wear resistance. The chemical composition of Jun porcelain shards determines their chemical stability, weather resistance, wear resistance, environmental compatibility, and non-slip properties, ensuring their long-term use and preservation in public spaces. Recycling Jun porcelain waste has significant advantages, reducing environmental pollution and conserving resources. Transforming waste into new materials for contemporary art and design can effectively reduce dependence on raw materials, reduce energy consumption, and reduce carbon dioxide emissions. These dual benefits align with sustainable development principles and provide new approaches to environmental protection and resource management. Recycling Jun porcelain waste also faces some challenges. The process involves complex social and ecological issues, and the main difficulties center on the technical aspects of recycling. The unique material and firing process of Jun porcelain makes traditional recycling methods ineffective. The small size of the fragments makes collection more difficult and increases the cost of sorting. In order to solve these problems, it is necessary to conduct research on the recycling and utilization of Jun porcelain waste and improve related technologies. In future research on Jun porcelain waste, research can be carried out in the following directions: material recovery and remanufacturing, the preparation of new materials with unique properties in combination with other industrial by-products, and the construction of a closed-loop supply chain system for the Jun porcelain industry. This research provides new material resources for the green development of China's Jun porcelain industry and lays the foundation for applying Jun porcelain waste in environmental protection.

6.0 Conclusions and Recommendations

6.1 Main Research Conclusions

After conducting physical and chemical performance and chemical composition tests on Jun porcelain fragments, it was found that they have reliable performance, durability and environmental friendliness, chemical stability, weather resistance, and wear resistance, and can be used in public places for a long time. The creative use of Jun porcelain waste provides a sustainable way to balance economic benefits and environmental protection. This research provides a theoretical basis for the sustainable use of Jun porcelain waste, proving that waste can be transformed into beautiful and practical materials, reducing environmental pollution and waste of resources. The innovative methods of this research have great potential for promoting the sustainable use of traditional materials. Experimental and case studies have shown great potential for developing and utilizing Jun porcelain waste based on its physicochemical characteristics. Waste can be transformed into high-quality building and decorative materials with appropriate processing and design. In addition, case studies have shown that waste reuse can enhance design's cultural content and improve product market competitiveness.

6.2 Practical Recommendations

To maximize the use of Jun porcelain waste, designers should develop design solutions based on the physical and chemical characteristics of the waste. For example, designers can use the unique colors and textures of the waste to create unique decorative and building materials. Exploring the combination of waste with other materials can further expand its scope of application. Government support in the form of tax, financial, and marketing incentives is crucial to promote the recycling of Jun porcelain. The government should develop a comprehensive set of recycling guidelines and strengthen public education to raise awareness and participation in recycling activities. How to efficiently recycle and dispose of Jun porcelain waste remains a technical challenge, and designers need help finding a balance between practicality and functionality. In future research, cross-disciplinary collaboration models should be strengthened,

such as integrating the construction industry, fashion industry, and scientific research institutions to explore the realization of environmentally sustainable development of the industry.

Paper Contribution to Related Field of Study

The paper contributes by presenting innovative methods to repurpose Jun Ware waste into sustainable design elements, addressing energy and waste challenges while promoting environmental sustainability, resource conservation, and cultural enhancement in ceramics and modern design.

References

Zhang, P., Zhang, P., & Wu, J. (2023). Mechanical properties and durability of sustainable concrete manufactured using ceramic waste: A review. Journal of Renewable Materials. doi:10.32604/jrm.2022.023290

Gol, F., Yilmaz, A., & Kacar, E. (2023). Sustainable technology: Recycling roof tile waste in the ceramics industry. Ceramics International. doi:10.1016/j.ceramint.2023.08.069

Zaharie, A., Tintisan, M. L., & Siomin, A.-C. (2022). The use of ceramic waste in the construction materials industry based on the concept of sustainable development. In 15th International Conference Interdisciplinarity in Engineering. doi:10.1007/978-3-030-93817-8_18

Tang, E. (2022). Green effects of research and development on industrial waste reduction during the production phase: Evidence from China and policy implications. Frontiers in Public Health. doi:10.3389/fpubh.2022.1000393

Cai, C. (2020). Application of Sustainable Green Environmental Protection Concepts in Interior Design. Building Materials and Decoration (07), 100-101. doi:CNKI:SUN:JCYS.0.2020-07-067.

Chen, L. (2024). Research on Ceramic Art Environmental Design Based on the Concept of Sustainable Development. Foshan Ceramics (03), 187-189. doi:CNKI:SUN:FSTC.0.2024-03-060.

Cheng, Z. (2021). Environmental Insights Triggered by Ceramic Characteristics. Western Leather (10), 91-92. doi:CNKI:SUN:XBPG.0.2021-10-046.

Guo, S. (2018). Strategies for Healthy Development of the Ceramic Industry Under Environmental Policies. In Proceedings of the 2018 National VOCs Monitoring and Governance Summit Forum (pp. 37-39).

Han, F. (2021). Discussion on the Application of Environmental Protection Ceramics in Modern Urban Construction. Low Carbon World (07), 213-214. doi:10.16844/j.cnki.cn10-1007/tk.2021.07.104.

Hang, J. (2018). History of Chinese Arts and Crafts [M]. Beijing: People's Fine Arts Publishing House.

Hao, H., & Wang, C. (2023). Analysis of the Development Prospects of the Advanced Ceramic Industry in Jingdezhen from the Perspective of Green and Low-Carbon. Jingdezhen Ceramics (05), 113-116. doi:CNKI:SUN:JDZT.0.2023-05-002.

Li, F. (2024). Research on Ceramic Art Education from the Perspective of Environmental Awareness and Sustainable Development. Jingdezhen Ceramics (02), 23-25. doi:CNKI:SUN:JDZT.0.2024-02-007.

Li, W., & Cheng, S. (2024). Analysis of the Current Situation and Future Trends of Ecological Ceramics Based on 3D Printing Technology. Beauty and Times (Upper) (04), 115-118. doi:10.16129/j.cnki.mysds.2024.04.039.

Liu, X. (2024). Exploration of the Application of Ceramic Materials in Public Art Sculpture Design. Shoe Craft and Design (01), 133-135. doi:CNKI:SUN:ZWXE.0.2024-01-044.

Lu, X. (2021). The Application Value and Significance of Ceramic Fragments in Environmental Art Design. Jiangsu Ceramics (04), 3-4+6. doi:10.16860/j.cnki.32-1251/tq.2021.04.001.

Ma, Q. (2019). Study on the Refinement and Application of Traditional Chinese Auspicious Patterns in Modern Furniture Design. Art and Technology (03), 81-82. doi:CNKI:SUN:YSKK.0.2019-03-053.

Peng, H., & Tang, L. (2022). Research on the Reuse of Waste Ceramics in Modern Landscape Design. Design (05), 152-154. doi:CNKI:SUN:SJTY.0.2022-05-044.

Ren, X. (2023). Exploration of the Integration of Sustainable Development and Environmental Protection Concepts in Creative Design of Cultural and Creative Products. In Proceedings of the Third Innovation Education and Development Academic Conference (pp. 436-444).

Wang, L. (2023). The Importance of Environmental Protection Concepts in Modern Ceramic Production. Ceramic Research (05), 113-115. doi:10.16649/j.cnki.36-1136/tq.2023.05.037.

Wu, Z. (2023). Principles and Development Strategies of Ceramic Art Design in Contemporary Urban Public Environment. Ceramic Science and Art (12), 22-23. doi:10.13212/j.cnki.csa.2023.12.005.

Zhang, Y. (2023). Application of Modified Ceramic Environmental Adhesives in the Restoration of Ceramic Artifacts. Chemistry and Adhesion (01), 93-96. doi:CNKI:SUN:HXYZ.0.2023-01-021.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organized by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Residents' Participation in Traditional Community Activities and Its Impact on Future River Environmental Program in Yogyakarta, Indonesia

Artbanu Wishnu Aji[1*], Suastiwi[1], Agus Burhan[2]
**Corresponding Author*

[1] Interior Design Study Programme, Faculty of Visual Arts, ISI Yogyakarta, Yogyakarta, Indonesia
[2] Fine Arts Study Programme, Faculty of Visual Arts, ISI Yogyakarta, Yogyakarta, Indonesia

artbanu@isi.ac.id, suastiwi@isi.ac.id, m_agusburhan@yahoo.com
Tel: +62 81903736408

Abstract
This study investigates the impact of residents' participation in traditional community activities on their future intentions toward environmental improvement. Structural equation modelling (SEM) and a questionnaire survey of 300 residents across three different areas were used. The results indicate a higher sense of environmental responsibility of residents in areas where the government's ecological programs are engaged than in places where non-governmental organizations (NGOs) are involved. However, residents demonstrate a greater intention to participate in future river environments with NGO involvement. The underlying motivation for participating in community activities is crucial in shaping residents' future intentions regarding river ecological programs.

Keywords: Community activity; Urban water environment; Future intention; SEM analysis

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6176

1.0 Introduction

In Indonesia, the traditional community activity known as gotong royong (GR) is crucial in enhancing and maintaining neighbourhood environments. GR involves collective action and mutual aid among community members, fostering social cohesion and addressing local issues. However, more than GR alone may be required in communities facing severe environmental challenges. Such communities need additional government and non-governmental organizations (NGOs) support to tackle these complex problems effectively. Yogyakarta is renowned for its strong community ties and adherence to traditional values, making it a prime example of where the spirit of GR remains vibrant in environmental initiatives. The city's commitment to GR contributes to a unique sense of place and fosters a strong citizen bond (Indraswara et.al., 2022). In the context of microenvironments such as homes and interiors, the traditional community in Yogyakarta continues to uphold the concept of sacred and profane spaces (Setiadi, 2022). When this concept is applied to an urban setting, urban rivers are often perceived as dirty spaces, diminishing their significance in the eyes of the community.

To combat this perception, environmental activists have been promoting the idea of the river as a front yard, aiming to elevate its importance and encourage community engagement in river conservation. This campaign leverages GR as a tool for regular river clean-

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6176

ups and maintenance, highlighting the socially driven nature of the activity. Evaluating the sustainability of GR in future environmental programs is essential to ensure its long-term effectiveness. Despite its prevalence, the impact of GR on ecological awareness and action, particularly in river environments in Indonesia, has yet to be thoroughly investigated. This research aims to find behavioural predictions between participants' motivation and intention to participate in river environmental improvement programs in the future.

2.0 Literature Review

Research on environmental participation and behavioural intention in Indonesia and Asia is well-established. For instance, Iman et al. (2019) explored the relationship between individuals' intentions, their knowledge of environmental issues, and how these factors influence ecological behaviours. Their findings indicate a significant correlation between environmental knowledge and behavioural intention, which drives ecological actions. This research highlights the critical role of knowledge as a catalyst for developing intentions to engage in environmental improvements. According to their study, individuals' actions in adopting environmentally friendly behaviours are strongly influenced by their prior knowledge and understanding of environmental issues.

Sugiarto et al. (2022) investigated the relationship between pro-environmental behaviour, education, and the intention to engage in environmental improvement. Their study found that while education alone does not directly affect pro-environmental behaviour, individuals' understanding of ecological awareness significantly influences their intention, leading to pro-environmental actions. This suggests that education fosters environmental awareness and knowledge, enhancing pro-environmental behaviour. Furthermore, Ong Tze Xien et al. (2020) Explain that ethnicity and education influence behavioural intentions to reduce non-revenue water consumption. This finding complements the factors in behavioural plans influenced by environmental knowledge and environmental concerns.

In a related study, Moon et al. (2015) examined the impact of norms, beliefs, and values on behavioural intentions in Pakistan, specifically focusing on consumer choices for environmentally friendly products. Their findings reveal that social and personal norms influence individuals' intentions to adopt environmentally friendly behaviours more than personal values and beliefs. This underscores the importance of strengthening social and personal norms to encourage consumers to make ecologically responsible choices. Both studies highlight the importance of education and social norms in shaping pro-environmental behaviours and intentions. Education is vital for instilling environmental knowledge and awareness, while social norms play a significant role in guiding individuals' environmental actions and consumer choices.

Chawla (2008) emphasized that individuals' motivation to engage in environmental improvement actions is significantly influenced by their early engagement with the environment, which heightens their ecological sensitivity. The study found that while environmental knowledge alone does not directly lead to environmental action, developing skills to determine effective environmental improvement strategies drives real action. This skill set is crucial, as individuals are more likely to take action when they can see their efforts' tangible results and benefits. In addition, community involvement is also influenced by the length of stay around the river area. The longer they have lived in the area, the more willing they are to participate (Mumbi & Watanabe, 2021)

Similarly, Pan et al. (2018) investigated the behavioural intentions of tourism students by examining three key variables: environmental knowledge, environmental sensitivity, and environmental responsibility. Their findings revealed that environmental knowledge alone does not directly influence environmental behavioural intentions. This is because knowledge can only be effectively applied with the necessary competence to act. The study highlighted that environmental sensitivity plays a critical role in fostering a sense of empathy towards the environment, generating a sense of environmental responsibility, and motivating individuals to engage in environmental actions. The researchers concluded that direct contact with the environment and exposure to environmental issues are essential for developing environmental knowledge to inform and guide students' actions.

Both studies underscore the significance of imparting environmental knowledge and cultivating the practical skills and sensitivity necessary to translate that knowledge into meaningful action. Early engagement with the environment and exposure to environmental challenges is critical in fostering a sense of responsibility and empowering individuals to take proactive steps toward ecological improvement.

Alias (2019) further found that knowledge and attitudes toward river pollution significantly impact individual behaviour regarding river sustainability. Correct knowledge tends to have positive effects, while distorted knowledge negatively influences individual environmental behaviour. Therefore, it is crucial to disseminate accurate information about river pollution and minimize the spread of misinformation concerning river ecological issues.

Zhou et al. (2023) aimed to bridge the gap between intention and behaviour by presenting a framework comprising five variables: publication and education, attitude, subjective norms, behaviour intentions, and behaviours. Their study revealed that while publication and education influence farmers' intentions to sort waste, subjective norms play a more substantial role in translating intention into environmental behaviour. Thus, effective waste management education must be supplemented with subjective solid norms to actualize ecological behaviour. Mould, S. A. et al. (2020) Found that motivation does not directly become action because it goes through enablers and barriers. Enablers such as government funding strongly stimulate individuals to participate in river environmental programs.

Research on community activities in river environments includes Ohashi's (2002) study in Japan, which examined citizen participation and activities utilizing river sites. In Indonesia, Darwis (2002) provided a detailed report on community empowerment in the Code River, Widodo (2010) highlighted the local wisdom approach in upgrading slum areas along the Code River, and Nurmandi (2006) studied community-based wastewater management in urban riverside settlements in Yogyakarta. The literature on behaviour intention extends beyond Indonesia to other Asian regions, where similar communal characteristics prevail. Knowledge, attitudes, norms, values, and beliefs motivate individuals to engage in pro-environmental activities. However, before taking action, individuals must first form an intention, which must be supported by a strategy to justify the action.

3.0 Methodology

Quantitative survey methods were used in this research to collect data on subjects' participation in GR. Descriptive statistical and path analyses were used to process survey data to find their participation motivation and future intentions in the river environmental program. We interviewed nine neighbourhood unit leaders to understand how Gotong Royong (GR) activities are planned and executed in different areas along the Code River bank. These leaders were chosen because GR activities are organized at the neighbourhood unit level, and they are deeply involved in addressing social and environmental issues within their communities. We distributed 304 questionnaires, one to each household across three areas along the Code River bank, ensuring a high response rate by conducting door-to-door interviews. CD I had 93 respondents, CD II had the highest number with 114 respondents, and CD III had 97 respondents. The questionnaire was divided into four sections: demographic information, involvement in GR activities, environmental awareness, and future intentions regarding ecological programs. We used SPSS 19 and AMOS 19 software to analyze the data, comparing residents' involvement profiles and future intentions related to river cleaning initiatives across different areas.

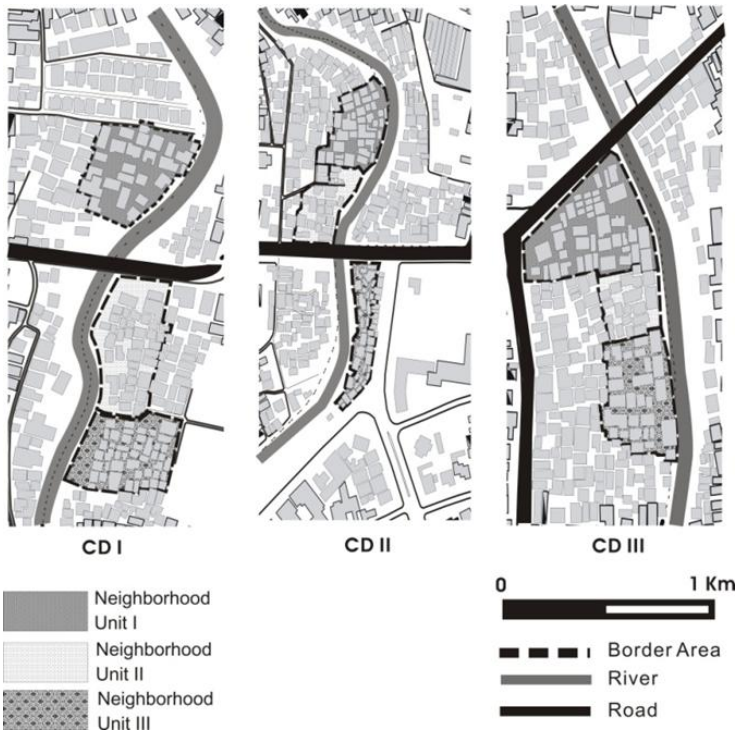


Fig. 1: Survey Location
(Source: Author, 2023)

4.0 Findings

This study's target areas are in densely populated neighbourhoods (Fig.1), each with distinct community characteristics shaped by their unique development histories. These areas are Cokrodiningratan (CD I), Gondolayu (CD II), and Cokrodirjan (CD III). CD I is inhabited by a more established community capable of self-development with minimal government and NGO intervention. It is well-known for its initiative, the Merti Code Festival, an annual event honouring the river through special ceremonies and art performances. CD II, in contrast, faced significant challenges in the early 1980s. It was home to illegal settlers living in poverty without proper sanitation. Redevelopment efforts led by NGOs transformed this area, garnering national attention due to its success. CD III benefited from local government assistance in developing the riverbank area. In 2005, the national government built condominiums for low-income residents as part of an urban slum upgrading policy. All three regions continue to uphold the traditional community activity of Gotong Royong (GR), which has been instrumental in neighbourhood improvement initiatives led by NGOs or the government. This continuity makes them ideal for a comparative study on the effectiveness and sustainability of GR in different community contexts.

4.1 Planning and Management of Gotong Royong Activity

Based on the interviews with the nine neighbourhood unit leaders, it was revealed that the majority of residents actively participate in Gotong Royong (GR) activities. The detailed results of these interviews, focusing on the planning and management of GR, are presented in Table 1. One major obstacle identified in the river cleaning efforts is the garbage that flows downstream from upper stream areas. This ongoing challenge has made many residents feel their efforts are futile, causing them to concentrate their cleaning activities primarily around their immediate neighbourhoods rather than the river.

GR activity frequency varies across the areas studied, reflecting their unique needs and circumstances. As shown in Table 1, CD II is the most active in GR activities, followed by CD I. These areas are particularly vulnerable during the rainy season, necessitating

extensive preparations to mitigate flood damage. Standard measures include installing stacked sandbags along flood-prone zones. Conversely, CD III, located in a busier neighbourhood, is less active in GR activities compared to the other two areas. The differing levels of engagement in GR activities highlight the impact of local conditions and community priorities on environmental participation.

Table 1. Interview results on GR activity in each studied area

AREA	AREA UNIT	Frequency in a month	Target Of GR	Decision Process	Obstacles
CD I	I	2 or 3	river	Community meeting	strong water current
	II	1	Neighborhood and river	assesement	garbage from the upper stream
	III	3	Neighborhood and river	Community meeting	garbage from the upper stream
CD II	I	4	Neighborhood and river	assesement	Tools
	II	2	Neighborhood and river	assesement	Piles of garbages
	III	2	Neighborhood and river	assesement	Stucked garbages
CD III	I	1	Neighborhood	assesement	Bamboo fish cage and garbages
	II	2	River	Community meeting	Garbage flocking the river
	III	2	Neighborhood and river	Community meeting	Smell and garbages

(Source: Author, 2023)

4.2 Residents 'Involvement Profile in Three CD Areas

Table 2 presents the demographic percentages of respondents from each studied area. Generally, all residents are eligible to participate in GR activities; however, the head of the family holds the social obligation to join as a contribution to the community. Typically, this role falls to an adult married man or an adult woman if the male head of the family is absent or unavailable. We cross-tabulated the areas, analyzing the frequency of participation, roles in GR, time allocation, preferences for GR, and reasons for joining. Using the Chi-square method, we found significant differences in the reasons for joining and roles in GR across the three areas.

Table 2. Respondents' demographics

		CD I	CD II	CD III
Gender	Male	60.2	35.1	37.1*
	Female	39.8	64.9	62.9
Education	Elementary School	25.8	26.3	18.6
	Junior High School	20.4	23.7	18.6
	Senior High School	44.1	28.1	52.6
	College	5.4	6.1	2.1
	No schooling	4.3	15.8	8.2
Occupation	Goverment employee	15.1	.9	5.2
	Private employee	18.3	19.3	16.5
	Labour	15.1	14.0	13.4
	Small entreprenuer	5.4	13.2	16.5
	Student	17.2	18.4	15.5
	No job/retired	29.0	34.2	33.0
Age group	10-20	14.0	20.2	14.4
	21-30	20.4	7.9	17.5
	31-40	16.1	16.7	9.3
	41-50	16.1	14.9	26.8
	51-60	20.4	28.9	19.6
	61-70	11.8	10.5	7.2
	71-80	1.1	.9	5.2
Position in the family	Head of household	45.2	22.8	22.7
	Family member	54.8	77.2	77.3
			*in precentage	

(Source: Author 2023)

This research categorized the reasons for joining GR into three groups: social responsibility, environmental responsibility, and not important. "Social responsibility" is the reason for joining because they want to socialize and maintain closeness, while "environmental responsibility" is a form of awareness to restore ecological damage. The last one is "not important", it is a form of compulsion to join because it feels inappropriate if you leave. Our findings indicate that respondents in CD III are predominantly driven by environmental responsibility, with the highest proportion compared to CD I and CD II (Fig. 3). This area has been successfully targeted for slum upgrading by the government, resulting in a well-maintained neighbourhood. In contrast, CD II, which received intensive NGO assistance in the past, has the lowest proportion of respondents motivated by environmental responsibility. Instead, CD II has the highest

percentage of respondents participating in GR due to social responsibility. This reflects the early advocacy efforts of the NGOs, which prioritized building social solidarity among settlers in the CD II area.

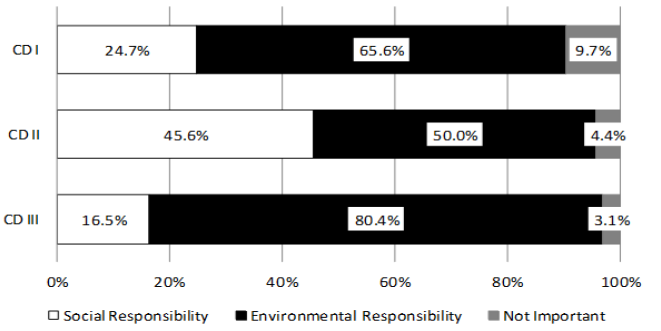


Fig. 2: Cross tabulation of respondents' reason for joining GR
(Source: Author 2023)

Although CD III has the most significant proportion of respondents with environmental responsibility reasons when joining GR, their role in GR activity is less critical than CD II and CD I. Only 22.7 % of respondents in CD III are capable of helping the primary worker when joining GR compared to 64% in CD II and 58.1 % in CD I (Fig. 4). The development of the CD III area is mainly assisted by local government which placed its residents as a passive actor during the process of development. Most of the construction projects were carried out by contractors with less involvement from the residents. The residents are primarily involved in maintaining the project after its completion and can add any public facility afterwards through GR activity.

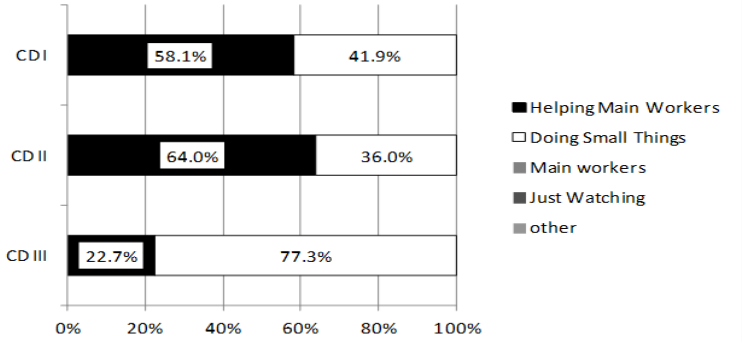


Fig. 3: Cross tabulation of respondents' role in GR
(Source: Author 2023)

Because the nature of GR activity is socially driven, we also measured the external influences that affected respondents' awareness of the river caring activity. We used five scales of agreement on four statements of external influences. These external influences are parents, friends, leaders, and peer pressure. ANOVA test was used to analyze the mean differences between studied areas. The result showed that leaders and parents are two external influences that are significantly different among the three studied regions (Table 3).

Table 3. External influences of respondents

		Sum of Squares	df	Mean Square	F	Sig.
my parent set good example on caring this river for me	Between Groups	4.053	2	2.026	3.259	.040
	Within Groups	187.181	301	.622		
	Total	191.234	303			
my friends set good example on caring this river for me	Between Groups	.026	2	.013	.399	.671
	Within Groups	9.855	301	.033		
	Total	9.882	303			
leaders set good example on caring this river for me	Between Groups	3.956	2	1.978	13.855	.000
	Within Groups	42.978	301	.143		
	Total	46.934	303			
My friends will consider me as bad person if I did not join	Between Groups	.276	2	.138	.214	.807
	Within Groups	193.984	301	.644		
	Total	194.260	303			

(Source: Author, 2023)

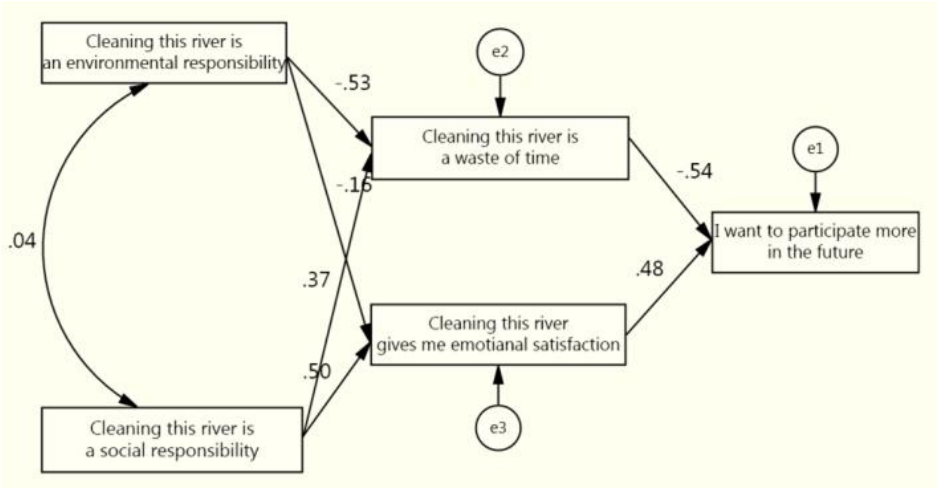
5.0 Discussion

5.1 Residents' Future Intention

To understand residents' future intentions in each studied area, we used path analysis to predict their intentions based on four variables. These variables consist of two parts. Part one is variables concerning the motivation or reason for joining GR. The motivation or reason for joining GR is split into two main categories: social responsibility and environmental responsibility. Part two is variables concerning their view on GR activity. This view was divided into emotional satisfaction and waste of time. In this path analysis, we want to see why they join GR, their view on GR activity, and how it influences their future intention.

5.2 CD I

Path analysis in CD I (Fig. 7) showed that respondents with environmental responsibility have higher regression weight on emotional satisfaction than those with social responsibility. However, the difference needs to be higher.



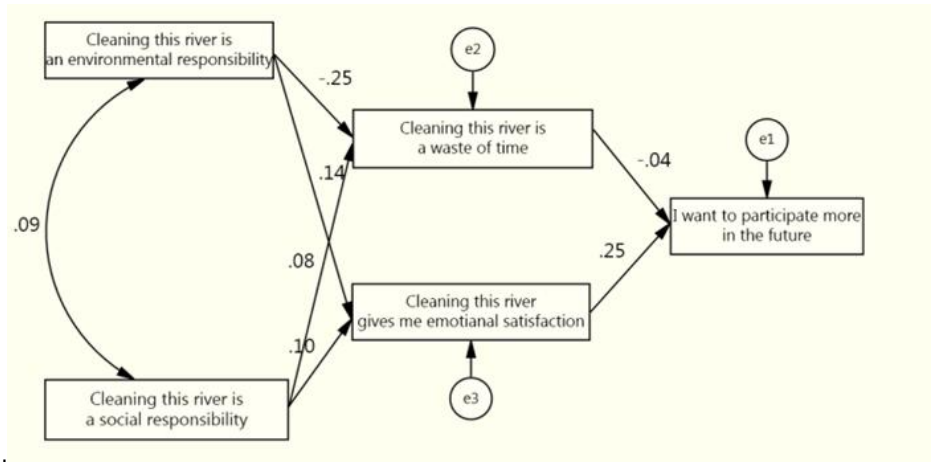
GFI= 0.982 AGFI=0.910

Fig. 4: Path analysis in CD I
(Source: Author, 2023)

On the other hand, respondents with social responsibility, although the value is small, still believe GR is a waste of time. CD I is between CD II and CD III regarding its residents' future intentions. Residents with emotional satisfaction in CD I are not as eager as those in CD II (Fig. 8) to participate more in future cleaning river programs; however, they are slightly higher than those in CD III (Fig. 9) areas in this regard.

5.3 CD II

In the CD II area, respondents with environmental responsibility showed negative regression weight on a view of cleaning rivers as a waste of time and as giving emotional satisfaction (Fig. 8). This means that in CD II, the action of cleaning rivers as an environmental act does not have much effect on respondents' willingness to join cleaning river activities. Respondents with environmental responsibility viewed cleaning river activity as neither good nor bad.



GFI=0.982 AGFI=0.910

Fig. 5: Path analysis in CD II
(Source: Author, 2023)

Respondents with social responsibility demonstrated high emotional satisfaction, indicating that they view cleaning the river as a service to the community. However, these respondents also saw the activity as a waste of time. Respondents with environmental responsibility in CD I also showed a lack of emotional satisfaction, though the values were not as harmful as in CD II. In CD II, the negative values suggest disappointment with the impact of their efforts. Respondents who experienced emotional satisfaction in CD II showed a high likelihood (0.48) of participating in future river environmental programs. Conversely, those who considered cleaning the river a waste of time exhibited strong negative values regarding future participation (-0.53).

5.4 CD III

The regression weight for respondents with environmental responsibility in CD III (Fig. 9) showed a similar trend to those in CD I. Respondents in both areas found cleaning river activities emotionally satisfying and did not view them as a waste of time. However, the regression weights in CD III were slightly higher than in CD I (Fig. 7). Although some respondents who viewed cleaning river activities as a waste of time were still willing to participate in the future, their regression weight value was meagre. This suggests that emotional satisfaction is a more reliable predictor of respondents' future intentions to join river environmental programs.

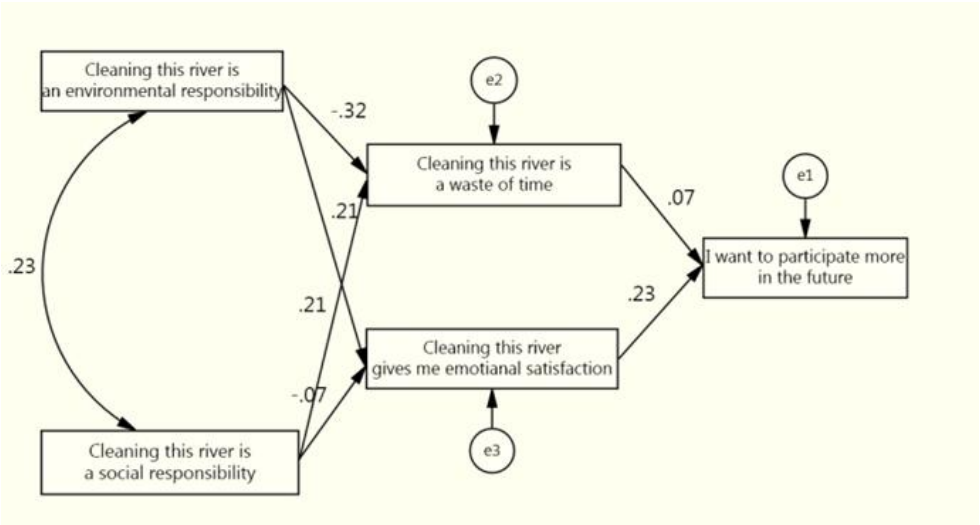


Fig. 6 Path analysis in CD III
(Source: Author, 2023)

5.5 Implications of findings for participants' future intentions

Emotional satisfaction is a predictor of behaviour to participate in river improvement activities in the future. These findings show that even though the initial intention is social if it results in emotional satisfaction, they will be more likely to participate in the future.

6.0 Conclusion & Recommendations

Each studied area in this research has unique characteristics that affect residents' future intentions regarding river environmental programs. In CD II, the results are divided into two categories: respondents with emotional satisfaction are likely to participate more in the future, while those who view the activity as a waste of time are not. Interestingly, in the CD II area, the source of this emotional satisfaction comes from respondents with social responsibility, a unique tendency compared to the other studied areas. Across all three studied areas, respondents with environmental responsibility do not view cleaning river activities as a waste of time. This suggests that ecological awareness is crucial in eliminating negative views toward environmental actions, while those with strong environmental awareness need to feel more satisfied with their efforts. If respondents with environmental responsibility can find greater satisfaction in their actions, future participation in river environmental programs is likely to increase significantly. However, it is essential to acknowledge the study's limitations, such as the participants' social environment cohesiveness, which can significantly impact their willingness to join any social activity regardless of their motivation. Further research can focus on the younger generation's interest in community social activities related to river conservation.

Paper Contribution to Related Field of Study

This paper clarifies the role of traditional community activities in improving urban rivers in Indonesia. The social nature of traditional activities can be channelled into environmental activities to solve ecological problems related to the water environment. It gives a path to developing environmental programs based on Indonesian society's social capital.

References

Alias, N. (2019). Correlation between Knowledge, Attitude and Behaviour Towards River Pollution. *International Journal of Modern Trends in Social Sciences, 2(9)*(DOI: 10.35631/IJMTSS.29004), 31-38.

Chawla, L. (2008). Participation and the Ecology of Enviromental Awareness and Action. In A. R. al. (Ed.), *Participation and Learning* (pp. 98-110). Springer.

Darwis, K. (2002). *Toward Kampong's Freedom, Building Civil Societies from the Root, Learning From Romo Mangun in Code River's Bank.* Yogyakarta: Yayasan Pondok Rakyat.

Iman, F., Miarsyah, M., & & Sigit. Diana, V. (2019). The effect of intention to act and knowledge of environmental issues on environmental behavior. *JPBI (Jurnal Pendidikan Biologi Indonesia), 5*(3), 529-536.

Indraswara, M. S., Hardiman, G., Rukayah, S., & Suprapti, A. &. (2022). Sense of Place of the Batik Trade Center in the Arab Village Sugihwaras Pekalongan, Indonesia. *ISVS e-journal, 9*(5), 98-109.

Moon, M. A., Habib, M. D., & Attiq, S. (2015). Analyzing the sustainable behavioral intentions: Role of norms, beliefs and values on behavioral intentio. *Pakistan Journal of Commerce and Social Sciences (PJCSS), 9*(2), 424 - 439.

Mould, S. A., K. A. Fryirs, & R. Howitt. (2020). The importance of relational values in river management: understanding enablers and barriers for effective participation. Ecology and *Society* 25(2):17 (doi.org/10.5751/ES-11505-250217), 1-16.

Mumbi, Anne Wambui, & Watanabe, Tsunemi (2021). Willingness to Pay and Participate in Improved Water Quality by Lay People and Factory Workers: A Case Study of River Sosiani, Eldoret Municipality, Kenya. Sustainability, 13 (doi.org/10.3390/su13041934)

Nurmandi, A. (2006). Development of domestic waste processing system for urban riverside settlement. Regional Conference on Urban Water Sanitation in Southeast Asian Cities.

Pan, S.-l., Chou, J., Morisson, A. M., Huang, W. S., & Lin, M.-C. (2018). Will the Future Be Greener? The Environmental Behavioral Intentions of University Tourism Students. *Sustainability, 10* (http://dx.doi.org/10.3390/su10030634), 1-17.

Setiadi, A. (2022). The Dynamics of the Sacred-Profane Forms and Meanings in the Kalang House Architecture, Yogyakarta, Indonesia. *ISVS e-journal, 9*(5), 145-154.

Sugiarto, A., Huruta, A. D., & Wen lee, C. (2022). Predictor of Pro-Enviromental Intention and Behavior: A Perspective of Stimulus-Organism-Respon Theory. *Sustainability, 14* (doi.org/10.3390/su142316047), 1-17.

Tze Xien Shelley Ong, Chong Shyue Chuan, Sia Bik Kai (2020). Modelling public intention to reduce Non-Revenue Water: An expanded version of the Theory of Planned Behaviour. *Asia Proceedings of Social Sciences* 6(2), (doi.org/10.31580/apss.v6i2.1267) 134-138.

Zhou, Y., Wei, B., Zhang, R., Zhang, L., Zhu, H., & Wen, T. (2023). Narrowing the Gap between Intention and Behavior? An Empirical Study of Farmers' Waste Classification in China. *Frontiers in Enviromental Science*(doi.org/10.3389/fenvs.2023.1045816), 1-9.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics, WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Organic Crafts: Optimization of environmentally friendly materials in craft products

Yulriawan Dafri*, Alvi Lufiani, Christabel Raissa Justine Herman, Gheitsa Alya Dinnia
**Corresponding Author*

Faculty of Visual Arts,
Indonesia Institute of the Arts, Yogyakarta, Indonesia

yulriawandafri@isi.ac.id, alufiani@isi.ac.id, christabelrjh@gmail.com, iam.gheitsaalya@gmail.com
Tel: +62 85878073703

Abstract
This article investigates the issues surrounding organic crafts from a material perspective, focusing on how optimizing environmentally friendly materials can enhance public awareness and impact craft product manufacturing. It identifies various materials suitable for crafting and highlights the importance of training artisans in sustainable practices. The research adopts a qualitative, multidisciplinary approach, utilizing textual and contextual analyses. Key findings emphasize the utilization of organic materials, increased environmental awareness, product diversity and aesthetics, the necessity for skill development, and the benefits of collaboration with academic institutions to promote sustainable crafting practices.

Keywords : Organic crafts; optimization; environmentally friendly materials; craft products

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6177

1.0 Introduction

The global community is increasingly confronted with significant environmental challenges, particularly those attributable to the unsustainable utilization of synthetic materials. These challenges have been exacerbated by rapid urbanization, industrialization, and a pervasive culture of disposability that encourages using single-use products. According to the United Nations Environment Programme (UNEP, 2021), approximately 300 million tons of plastic waste are generated annually, with a substantial proportion of this plastic being non-biodegradable. This accumulation of plastic waste contributes markedly to environmental degradation, as synthetic materials such as plastics require hundreds of years to decompose, thereby inflicting long-term damage to ecosystems and biodiversity.

In addition to their ecological impact, synthetic materials pose considerable health risks to human and animal populations. Microplastics, for instance, have infiltrated the food chain, raising critical concerns regarding their potential effects on human health. Furthermore, the World Bank (2018) estimates that approximately 2 billion tons of waste are produced globally each year, with at least 33% of this waste inadequately managed in an environmentally safe manner. The mismanagement of waste frequently results in the pollution of waterways, degradation of soil quality, and heightened greenhouse gas emissions, thereby intensifying existing environmental crises.

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6177

Among the most pressing concerns is the detrimental effect of non-organic materials on soil, water, and air quality. Chemical residues from synthetic materials are known to leach into soil and groundwater, resulting in contamination that adversely affects agricultural productivity and drinking water supplies (UNEP, 2019). Such contamination poses a significant threat to food security, particularly in vulnerable regions with high agricultural dependence. Moreover, the production and disposal of synthetic materials are substantial contributors to greenhouse gas emissions, exacerbating global warming and climate change (IPCC, 2021). The increase in greenhouse gases contributes to rising global temperatures and disrupts climatic patterns, leading to extreme weather events that can devastate communities and ecosystems.

In light of these challenges, adopting organic, environmentally friendly materials in craft products emerges as a viable solution to mitigate the adverse effects of synthetic materials. Organic materials, including bamboo, coconut shells, and natural fibers, are not only renewable but also biodegradable, rendering them significantly less harmful to the environment (Väänänen & Pöllänen, 2020). The sourcing of these materials is often local, which can bolster regional economies while simultaneously reducing the carbon footprint associated with transportation. Additionally, incorporating organic materials in crafting aligns with the growing consumer demand for eco-friendly products and sustainable practices.

However, the practical application of these materials within the crafting sector remains underdeveloped, particularly in regions such as Yogyakarta, Indonesia, where artisans frequently lack the requisite skills and knowledge to maximize the utilization of organic materials. Despite the region's rich cultural heritage and traditional craftsmanship, economic limitations and restricted access to information and training often impede the transition to sustainable practices.

The primary objective of this study is to investigate the multifaceted issues surrounding public awareness regarding the significance of utilizing organic materials, the implications of implementing environmentally friendly materials in craft product manufacturing, and the identification of suitable organic materials for crafting applications. By integrating creative, critical, and innovative methodologies, this study aspires to promote adopting sustainable practices within the craft industry, ensuring preserving essential natural resources for future generations and fostering a heightened awareness of the environmental consequences of material choices.

2.0 Literature Review

This literature review will describe things related to research topics carried out by previous researchers who study or discuss the same or are close to the same thing as this study. The name of organic crafts is labeled for craft products made using environmentally friendly materials. It is not a material that is processed in a factory. Some of the sources of information that are still related to the topic of the study include the following.

Thinking Through Craft Book, Adamson, Glen. (2007). In this book, Adamson explains that craft emphasizes technical skills and imagination, providing functional results that produce a contemplative object and have a use. Therefore, the craft is a field of expertise that requires a different way of thinking, namely, thinking through action. Craft is an intellectual, creative, and physical activity with novelty value in using materials and aesthetics. It not only reflects the characteristics of a person but also shows critical investigation and investigation. A journal concludes that craft is characterized by specialized knowledge, localization, ethics and authenticity, and continuation of tradition; it is seen to be 'consistent with the principles of sustainability' (Zhan *et al*., 2017). Meanwhile, Risatti discusses crafts from various perspectives in the book A Theory of Craft (2007). It starts from the fundamentals that set crafts apart from fine arts, including the ontology of crafts, specific objects of crafts, and others. Interestingly, Risatti stressed that the aesthetics of handmade goods cannot be used to define the aesthetics of art in general. The reason is that crafts have a unique vocabulary and qualities that set them apart from other great artworks.

The title of the research, "Eco Design: Exploration and Application of Thorny Pandan Materials to Support the Creative Economy of Arts and Tourism Crafts in Pangandaran" (Hendriyana *et al*., 2020) explained that in the Pangandaran area, there are many pandan plants (*Pandanus tectorius*), but the condition is significantly harmed, and the local administration shows no concern for good governance. This research aims to produce regionally superior craft art products to support tourism by raising the potential of natural resources and artisan resources in the local community. This article is one of the results of applied research, a type of practice-led research focusing on the creative industry of craft art products that support tourism through eco-design and eco-tourism approaches. The study shows that the creative sector of pandanus-based crafts and design (*Pandanus tectorius*) has excellent potential and must be developed in Indonesia. First, handicraft products made from pandan are environmentally friendly and can reduce the use of plastic raw materials that are difficult to destroy. Second, Indonesia has natural resources (SDA) in pandan forests.

Other journals from Ratna et al. (2013) published in the Journal of Building Engineering Education-K.1509034-2013 explain various ecological or environmentally friendly materials applied to manufacture buildings, with a case study of Bank Indonesia. According to the survey, one way that people can slow down the rate of global warming is by using ecological materials in conjunction with the notion of green architecture. Furthermore, it has been demonstrated that it has no damaging long-term or short-term effects on the environment. Meanwhile, related to developing environmentally friendly textiles with Sisal Fiber Materials, Hayati (2019). In this article, she questioned the issue of environmental damage, primarily synthetic materials that can harm the environment. In 2000, there was a movement for eco-textiles, sustainable design, and others, all of which were to protect environmental resources in the future. Environmentally friendly textiles can be developed in terms of materials. Natural fiber is an alternative raw material for environmentally friendly textile products; one type of plant is sisal. The use of sisal fiber textiles has not yet experienced further development, being limited to ship ropes and plain weaving.

In another research, in the field of research and creation using environmentally friendly materials, the author also carried out research activities in 2016. The research was entitled "Innovation and Diversification of Eco-Art-Based coconut shell waste products in Panjangan

Bantul Yogyakarta." In this research and at the same time creation, the author and research member Dr Suastiwi (2016) used environmentally friendly materials, namely coconut shell waste, to manufacture craft products. Coconut shell waste is found in many corners of the country. The source of this material is very abundant, but it has yet to be utilized to the fullest. Through research and creation, various types of practical, functional craft products can be made, as well as works of art for decoration. Manufacturing different products through diversifying existing products creates various products with economic value. From this research, the craft community can make the most of this material in creating craft products based on environmentally friendly materials. One of the uses of organic matter is from rocks in nature.

In 2021, the author conducted research with the title "Application of Pumice Igneous Rocks on Living Room Sitting Lamps, which was published in the journal ARS Vol. 25, No. 1 (2022). It is explained that one form of natural material that has organic properties is rock. Rocks are formed by natural processes on earth, not through the manufacturing processes produced by factories. As collecting and using rocks from nature does not harm the surrounding area, using rocks in nature is one approach to preserving the environment and creating environmentally friendly creative goods. Using natural organic sources such as rocks is very beneficial for developing the people's economy, especially workers or artisans. This environmentally friendly material is easy to obtain, and if responded to creatively, it can produce craft products with functional and selling value. In this study, pumice rock was chosen as the primary material. The pumice rock is used and applied to sitting lamp products.

3.0 Methodology

The research method employed in this study is multidisciplinary, aligning with Soedarsono's assertion that an interdisciplinary approach is particularly suitable for examining craft-related (fine arts) fields. The fine arts research domain can leverage various methodologies, including communication, anthropology, sociology, archaeology, history, metallurgy, psychology, and iconography (Soedarsono, 2001). This study utilizes explicitly craft theory to explore the epistemological and ontological understanding of crafts (Risatti, 2027), while aesthetic theory is applied to assess the aesthetics of the materials and products derived from these materials (Munro, 1967).

The research is conducted from relevant scientific perspectives, allowing for textual and contextual analyses. Textual analysis aims to evaluate the aesthetic value of the organic materials studied, analyze the aesthetic qualities of the produced objects, and interpret their significance as cultural artifacts (Spradley, 1980). In contrast, contextual analysis investigates the socio-cultural aspects surrounding the issues at hand, classifying this research as qualitative with a multidisciplinary approach.

Data collection involves a field study over three months, focusing on craft centers that utilize environmentally friendly materials, such as coconut, bamboo, and wood. These locations were specifically chosen to represent the broader craft community, showcasing traditional practices that integrate sustainable materials. The researcher engaged with 20 participants, including artisans and industry experts, to gain diverse insights into the crafting process.

Techniques employed in data collection included direct field observations and in-depth interviews (deep interviews) with selected participants. Simultaneously, visual data collection was conducted using photographic documentation to capture the crafting processes and products. After the data collection, the analysis phase commenced, which involved visual (textual) analysis focusing on the shape and physical structure of the material objects and their products. Contextual analysis further examined the interplay between materials and the socio-cultural dynamics of the surrounding community.

4.0 Findings

The essential findings from field research in Yogyakarta and its surroundings include various aspects related to organic materials, environmental awareness, product variety, product quality, mentoring, and collaboration with academics.

Fig. 1. Remaining bamboo and coconut shell fragments are frequently discarded despite their potential uses.
(Source: Dafri et. al., 2024)

First, many craftsmen still need to make full use of organic materials. Although the potential of organic matter is quite significant, this material is often wasted. This shows that skills and knowledge in managing organic materials are not optimal among craftsmen. Second, awareness about using environmentally friendly materials still needs to be improved among craftsmen. Despite the trend toward using organic materials, Many still use synthetic materials according to market demand. This low awareness results in a need for more attention to the environmental impact of the materials used. Third, Yogyakarta's organic craft products are diverse in aesthetics, shape, and function. These products include household needs, exteriors, accessories, and kitchen utensils. Nonetheless, there is an opportunity to continue to develop product variations to make them more attractive and functional. Fourth, there is a need for continuous assistance and workshops or training to improve craftsmen's skills in the use of organic materials and design development. This assistance must be carried out periodically to ensure that craftsmen continue to develop and can produce quality and environmentally friendly products. Finally, the involvement of the College of Arts is essential to help create new designs and improve product quality, technological innovation, and marketing strategies. Collaboration between artisans and academics will be very beneficial in creating attractive and functional craft products that can compete in the global market. Universities can contribute to joint research and the development of relevant curricula.

The methodology employed included interviews with artisans, visual documentation, and field observations, and the analysis process combined both textual and contextual approaches. Below is a summary of the findings:

Table 1. A summary of the findings

Key Findings	Observation	Analysis/Impact
Utilization of Organic Materials	Many artisans must fully utilize organic materials, leading to significant waste despite the potential.	Despite abundant natural resources, craftsmen need more knowledge and skills to optimize their use.
Environmental Awareness	Awareness about the importance of using environmentally friendly materials needs to be improved among craftsmen.	Craftsmen still rely on synthetic materials due to market demand, negatively affecting the eco-friendly potential of their products.
Product Diversity and Aesthetics	Organic craft products in Yogyakarta are diverse but require further development to be more functional and aesthetically pleasing.	Although product variety exists, the products must be fully competitive due to design and material limitations.
Training and Skill Development	Continuous assistance and workshops are needed to enhance organic material management and product design skills.	Educational support is needed to enhance craft designs, improve material processing, and raise environmental awareness.
Collaboration with Academics	Partnerships between artisans and academics are vital for product innovation, quality improvement, and market competitiveness.	While partnerships with academic institutions have produced some new designs, the industry still needs more academic engagement to enhance product quality and sustainability.

(Source: Dafri et. al., 2024)

5.0 Discussion

Due to Yogyakarta's designation as a city of arts and culture has become a center for selling craft products that never die. This has resulted in the emergence of young artists, craftspeople, designers, and craftsmen in this field, making Yogyakarta the number two city after Bali as the center of tourist visits in Indonesia. Various forms of craft products have emerged, with diverse forms, functions, and materials used. On the one hand, this is a positive trend to help improve the community's economy through the craft sector and craft products for those engaged in this field. However, on the other hand, it impacts the large number of materials needed to make various kinds of products. This is a problem that needs to be solved. Moreover, many craft products sold in the field no longer think about "eco-friendly materials" but use any material; the important thing is that the product can be sold in the market.

Fig. 2. Several products were created from waste materials, such as bamboo and coconut shells.
(Source: various sources from Google, 2024)

Given this fact, the author is keen to learn more about applying sustainable materials like bamboo and coconut trees (coconut shells), whose resources are still abundant but have yet to reach their full potential. Therefore, on this occasion, the author tries to invite crafters, craftsmen, artists, and even students to be a common concern in helping to develop environmentally friendly material-based craft products. As is known, bamboo is a very sustainable material and can be used for any purpose. Bamboo is a very environmentally friendly material. It is a renewable and biodegradable material.

Fig. 3. Eco-friendly characteristics of bamboo material.
(Source: https://ecowonder.co.uk/eco-bamboo, 2024)

Furthermore, bamboo does not require pesticides or fertilizers during its growth, thus making it more environmentally friendly compared to other trees (Väänänen & Pöllänen, 2020). The benefits of bamboo are numerous; it has been proven to have been utilized since time immemorial, both in Indonesia and other countries in Southeast Asia, as well as in Asia in general. A bamboo tree can be used for various purposes, depending on which part of the bamboo you want to use. The same is true of the coconut tree (coconut shell). This tree also thrives in all corners of the country. From Sabang to Merauke, this tree grows wild without having to be planted, and this tree is one of the environmentally friendly trees.

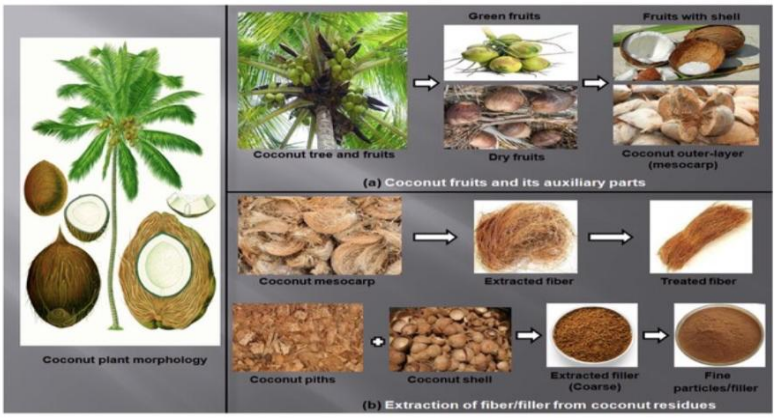


Fig. 4. Coconut trees being used for a variety of purposes.
(Source: Journal of Clean Production 255 (2020) 120169)

This coconut tree has been proven to be utilized for various purposes. From the trunk, fruit, leaves, sticks, coir, and shell can be used for household needs and other functional craft products. For these reasons, selecting these two materials is essential for further study. For information, the study area conducted by the author is spread across several areas of Yogyakarta and its surroundings. The author took data from Cebongan, Brajan Sleman, Muntuk, and Dlingo Bantul Yogyakarta for the bamboo study. At the same time, the research area for coconut shell material was carried out in the Guo Sari area, in the villages of Santan, Sorosutan Umbul Harjo, and Maguwoharjo Yogyakarta.

6.0 Conclusion and Recommendations

From the research activities that the author has carried out in several locations in Yogyakarta and its surroundings, with a focus on optimizing the use of bamboo and coconut shell organic materials, several things can be concluded as follows. The research has produced several important conclusions about using organic materials such as bamboo and coconut shells in handicraft products. Direct observation and in-depth analysis show that many craftsmen or artisans have been unable to make the most of organic materials in

producing handicrafts, even though the potential of organic materials is quite immense. Organic materials could be more optimal, as seen from the amount of organic matter wasted, so it is necessary to increase skills and knowledge in organic material management.

Awareness of environmentally friendly organic materials is still low among artisans in industrial centers. Many artisans still use non-organic or synthetic materials as per consumer requests or orders, resulting in products that are often not 100% organic and reduce the eco-friendly value of the craft. Therefore, education about the importance of organic materials and sustainability needs to be increased.

Additionally, it is essential to acknowledge the limitations of this study, which primarily focuses on Yogyakarta and may not represent other regions or contexts. The sample size and qualitative methods employed could introduce subjective biases that affect the findings.

To increase the effectiveness of using organic materials in crafts, several recommendations are made. Firstly, there should be increased research and innovation in processing techniques and using organic materials to create more sustainable and high-quality products. Secondly, education and awareness programs about the importance of using organic materials and sustainability should be improved through campaigns, seminars, and workshops. Thirdly, cooperation between the government, industry, and artisan communities must be encouraged to create policies that support organic materials and improve market access. Finally, adequate infrastructure for managing and processing organic materials is necessary to enable crafters to operate more efficiently in production.

Acknowledgments

The author thanks the Faculty of Visual Arts at the Indonesia Institute of The Arts Yogyakarta for the opportunity to publish this article. For their valuable data and support, gratitude is also extended to all parties, especially the bamboo and coconut shell craftsmen in Yogyakarta.

Paper Contribution to Related Field of Study

This paper provides essential insights for ISI Yogyakarta University, emphasizing the need for organic materials and eco-friendly practices in crafts. Given the influx of synthetic products, public awareness of sustainable materials is crucial. The regional government should engage the community to promote environmental protection and sustainable practices in Yogyakarta's craft production.

References

Dafri, Y. (2022). Pengaplikasian Batuan Beku Pumice pada Lampu Duduk Ruang Tamu. Jurnal ARS Vol. 25, No. 1.

Dianita, R., Sucipto, T. L. A., & Sutrisno. (2013). Analisa Pemilihan Material Bangunan Dalam Mewujudkan Green Building. Studi Kasus: Gedung Kantor Perwakilan Bank Indonesia Solo. Pengkajian Mahasiswa Program Studi Pendidikan Teknik Bangunan, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Sebelas Maret.

Glenn, A. (2007). Thinking through Craft. New York: Berg Publishers.

Hayati, N. (2019). *Pengembangan Tekstil Ramah Lingkungan dengan Material Serat Sisal*.

Hendriyana, H., Putra, I. N. D. P., and Sunarya, Y. Y. (2020). Eco Design: Eksplorasi dan Aplikasi Material Bahan Pandan Berduri untuk Mendukung Ekonomi Kreatif Kriya Seni dan Pariwisata di Pangandaran, Bandung: Panggung.

Intergovernmental Panel on Climate Change (IPCC). (2021). Climate Change 2021: The Physical Science Basis. Retrieved from www.ipcc.ch

Masri, A. & Pasaribu, Y. M. (2018). ADPII: *Craft dan Desain di Indonesia* : Sudut Pandang Akademik dan Pelaku. Bandung: Aliansi Desainer Produk Indsutri Indonesia.

Munro, T. (1967). The Morphology of Art as a Branch of Aesthetic, in Beardsley, M. and Schueller, H. Aesthetic Inquiry. Essays on Art Criticism and the Philosophy of Art. Belmont, California: Dickenson Publishing Company, Inc.

Nunes, L. A., Silva, M. L.S., Gerber, J. Z., & Kalid, R. D. A. (2020). Waste Green Coconut Shells: Diagnosis of the Disposal and Applications for Use in Other Products. Journal of Cleaner Production 255: 120169

Risatti, H. (2007). A Theory of Craft. Chapel Hill: The University of North Carolina Press.

Spardley, J. P. (1980). Participant Observation. New York: Holt, Renehart and Winstone.

Soedarsono, R.M. (2001). Metode Penelitian Seni Pertunjukan dan Seni Rupa. Bandung: Masyarakat Seni Pertunjukan Indonesia.

The World Bank. (2018). What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Retrieved from www.worldbank.org

United Nations Environment Programme (UNEP). (2019). Global Environmental Outlook 6. Retrieved from www.unep.org

United Nations Environment Programme (UNEP). (2021). Plastic Waste Management Facts and Figures. Retrieved from www.unep.org

Väänänen, N. & Pöllänen, S. (2020). Conceptualizing Sustainable Craft: Concept Analysis of Literature, The Design Journal, DOI: 10.1080/14606925.2020.1718276

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Recycling Textile Waste For Craft Industries: An experimental approach to eco-friendly papermaking

Siti Rohaya Yahaya*, Jazmin Mohamad Jaafar , Liu Mingquan, Guo Chunli

** Corresponding Author*

School of Arts,
Universiti Sains Malaysia, Penang, Malaysia

ysrohaya@usm.my; jazminjaafar@usm.my, liumingquan7788@student.usm.my; guochunli@student.usm.my
Tel: +601170331660

Abstract

The textile industry significantly impacts the environment through waste generation, contributing to landfill space in Malaysia. This research explores innovative solutions for using textile waste in handmade paper production. Objectives include identifying and classifying suitable textile waste types, evaluating natural and synthetic fibre extraction processes, and developing eco-friendly formulations. Employing a mixed-methods approach, the study emphasises experimental aspects and the 3R concept (reduce, recycle, reuse) for sustainability. Outcomes will promote recycling and repurposing textile waste in papermaking, highlighting the social and economic benefits of sustainable practices in the industry.

Keywords: textile; waste; handmade paper

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open-access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6178

1.0 Introduction

The textile industry is one of the largest and fastest-growing sectors globally, playing a crucial role in economies but simultaneously contributing to a significant waste problem. Each year, millions of tons of textile waste are generated worldwide, posing a serious environmental threat (Tang, 2023). Textile waste primarily consists of discarded clothing, fabrics, and textiles from consumers and industries. (Stanescu M. D. (2021)). According to Huun, K. (2023), countries like China and the United States lead in textile waste generation, with a combined total of over 37 million tons per year. Unfortunately, much of this waste ends up in landfills, contributing to greenhouse gas emissions, water pollution, and soil contamination. The problem is further compounded by inefficient waste management systems and low recycling rates, particularly in countries with high textile consumption (Kasavan. et al., 2021).

In Malaysia, textile waste has become an increasingly pressing issue, with the volume of discarded textiles rising dramatically in recent years. Melaka Solid Waste Management and Public Cleansing Corporation recorded more than 40,000kg of fabric waste collected within 24 hours during the campaign of the "Largest Recycle Fabric Materials Collected in a Day"(Bernama, 2022). Moreover, Solid Waste Corporation and KlothCares mentioned that 31 per cent or 432,901 metric tonnes of total waste generated in Malaysia in 2021 was fabric waste (Bernama, 2023). The United Nations reported that the world produces an estimated 100 billion garments annually, of

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6178

which 92 million tonnes end up in landfills. At least seven per cent of landfills comprise discarded clothing and textiles, and about one per cent of clothing is recycled. These findings indicate that textile waste recycling needs to be emphasised more than other forms of waste, such as plastics and paper.

Efforts to manage and recycle textile waste also remain limited despite the growing urgency of the problem. In contrast, there is potential for repurposing textile waste into sustainable products such as handmade paper or home décor, for which these practices remain underutilised. Public awareness of recycling opportunities and environmental stewardship is also low, as only a small percentage of textile waste is recycled despite the vast majority being recyclable (Bernama, 2023). This increasing burden of textile waste requires urgent attention, with a focus on sustainable practices, public education, and improved recycling systems. By addressing the environmental, economic, and social dimensions of textile waste, it can reduce its impact and promote a more sustainable and circular approach to the industry.

On the other hand, immediate action is required to address this environmental issue, necessitating the collaboration of all relevant stakeholders. Implementing the 3R concept—Reduce, Reuse, Recycle—at universities and other institutions of higher learning is essential for fostering environmental protection and supporting economic sustainability within communities through recycling. When integrated into teaching and learning, particularly in product design and fine arts, the 3R concept can facilitate a deeper understanding and appreciation of the value of recycled materials derived from textile waste.

Research focused on textile waste management, particularly fabric waste recycling through the 3R concept, offers a viable alternative for reducing textile waste and promoting a greener environment. According to Utabey et al. (2020), the 3R concept emphasises solid waste reduction by encouraging the reuse of items in domestic and office settings and the recycling of materials by reprocessing used goods into enhanced products. Developing innovative approaches for repurposing textile waste into new, functional products is imperative. Applying the 3R concept can introduce a fresh perspective on waste management, especially for economically valuable materials that can be recycled. One efficient application is the papercraft industry, where textile waste can be transformed into handmade paper and other craft products.

Therefore, this research explores the potential of recycling textile waste for producing handmade paper, contributing to environmental sustainability and innovative craft practices. The study aims to identify and categorise different types of textile waste suitable for repurposing, optimise the extraction processes for natural and synthetic fibres to meet the quality standards of the handmade paper industry, and develop environmentally friendly formulations to enhance the sustainability and functionality of eco-friendly handmade paper products. Additionally, the research offers the practical applications and economic feasibility of using recycled textile waste in handmade papermaking, promoting greater awareness and adoption of sustainable practices within the craft industry and beyond.

2.0 Literature Review

The textile industry is vast and multifaceted, producing various products that serve various purposes, from clothing and home furnishings to industrial applications. The fibres used in textile production, both natural and synthetic, are often blended in varying proportions to create materials with specific qualities tailored to the intended use. These products can range from short-term disposable items to medium-term goods, such as clothing, carpets, and automotive interiors, which have a lifespan of several years, depending on the material and usage (Diah et al., 2012).

According to Rani et al. (2022), the use of synthetic textiles in fashion and industrial applications has increased significantly in recent years due to their advantages, such as durability and cost-effectiveness. However, these man-made textiles present a substantial environmental challenge, as they resist biodegradation and can persist in the environment for hundreds of years. Furthermore, the degradation of synthetic fibres releases harmful substances that contribute to environmental pollution. In light of these concerns, there has been growing research and industry initiatives focusing on the utilisation of textile waste to create handmade, eco-friendly products. For example, FabBRICK, an innovation by Clarisse Merlet, transforms discarded textiles into an insulating, structural, and aesthetically pleasing building material. FabBRICK can be used as standalone bricks, partition walls, or integrated components in various products such as chairs and tables, offering a sustainable alternative to traditional building materials (Reyyan, 2024).

Furthermore, traditional craft techniques are also being revisited to upcycle textile waste. Singh S. (2021) highlights that applying traditional Indian textile techniques to recycling and upcycling processes can significantly enhance the aesthetic value of repurposed materials. Minakshi J. (2018) reinforces this view, suggesting that textile waste crafts have the potential to produce items that are ecological, ethical, and highly personalised. These environmentally friendly and unique products offer consumers beautiful and exclusive alternatives to mass-produced goods. This growing interest in crafting with textile waste demonstrates how cultural traditions can be leveraged to address contemporary environmental issues while fostering creativity and sustainability. Anjali (2023) adds that upcycling can also be integrated into indigenous textile weaving practices, helping to preserve cultural heritage while fostering ecological responsibility. By incorporating the 3R concept (Reduce, Reuse, Recycle), designers and artisans can capitalise on this opportunity, transforming textile waste into new garments and accessories, such as macramé bags and dresses, that combine diverse techniques and styles.

As highlighted by Gvoka et al. (2023) in their study presented at the VI International Conference on Contemporary Trends and Innovations in the Textile Industry, textile waste recycling can reduce the reliance on virgin materials and mitigate the environmental footprint of the textile and packaging industries. The study underscores the potential of repurposing waste textiles into new packaging materials, such as bags, sacks, and paper products, by incorporating textile fibres into paper and cardboard. These materials exhibit superior mechanical properties, such as enhanced tensile strength and wear resistance, and offer opportunities for creative and eco-friendly packaging solutions. By embracing textile recycling in packaging, industries can contribute to a circular economy, promote

sustainability, and reduce waste. Therefore, this research aligns with this paper, which focuses on recycling textile waste into handmade paper, as both processes demonstrate the potential for repurposing discarded textiles into functional, sustainable materials that address pressing environmental concerns.

Various studies above highlight the potential of utilising discarded textiles in innovative ways, where waste fabrics are transformed into functional and aesthetically appealing products. For instance, the use of discarded fabric, a byproduct of textile production, has been effectively employed in craft training programs to empower communities by providing new sources of income (Bakri & Hasyim, 2024). Bakri (2024) added that involvement with communities also helps reduce waste and increase communities' income. Moreover, the integration of traditional craft techniques with modern recycling practices not only addresses textile waste management but also enhances the cultural and economic value of recycled materials (Minakshi, 2018; Singh, 2021). These initiatives demonstrate that textile waste, including fabric scraps, can be repurposed into eco-friendly products such as handmade paper, supporting broader sustainability goals while fostering creativity and economic resilience in local communities.

3.0 Methodology

This research is driven by the growing demand for sustainable "eco-friendly " in the context of environmental preservation and resource management. The study originates from the need to identify suitable alternatives to natural plant fibres in paper production, specifically focusing on using textile waste, a significant environmental pollutant. While textile waste poses a substantial ecological challenge, it also presents unique opportunities due to the diversity of fibres it contains. These fibres can be repurposed to form new layers, offering considerable potential for creating handmade paper. In support of the 3R concept (Reduce, Reuse, Recycle), this research employs a quantitative method by applying the experimental process to assess the feasibility of using textile waste in handmade paper production. The study is structured into two main phases, each focusing on different process aspects.

Table 1. Process phases

Phase	Project	Methods And Analysis	User
Phase 1 (Reduce, Reuse, and Recycle)	Identifying the potential of textile waste in handmade papermaking.	Experimental Studies	Textile users, Designers, Retailers and Manufacturers
Phase 2	Studying the extraction process of natural and synthetic fibres suitable for use in handmade paper manufacturing. Develop proper formulations, dye, and binder solutions that are eco-friendly and can be used for handmade craft paper.		Fine Arts Students

(Source: Yahaya et al., 2024)

3.1 Phase 1: Collection, Selection, and Extraction of Textile Waste

The first phase of the research involves the systematic collection and classification of textile waste from various sources, including end-users, fashion designers, clothing retailers, and industries that discard excess fabric or outdated clothing. The collected textile waste is meticulously sorted based on type, colour, and material composition to ensure that the raw materials are appropriate for further processing into handmade paper. This phase is crucial as it lays the foundation for the quality and consistency of the final product. Art students from the School of The Arts assisted in this phase, gaining practical experience through hands-on involvement in the collection and separation tasks, which were complemented by a series of lectures on material art research.

3.2 Phase 2: Experimentation and Production of Handmade Paper

In the second phase, the research shifts to the experimental production of handmade paper, focusing on fibre extraction, binding, and dyeing. This phase is dedicated to developing and refining environmentally friendly formulas and methods to ensure that the handmade paper meets high-quality standards while minimising environmental impact. The experimentation involves testing various techniques to identify the most effective and sustainable strategies for producing durable, aesthetically pleasing handmade paper from textile waste.

4.0 Findings

4.1 Materials

Fig. 1. Discarded Fabrics Waste.
(Source: Yahaya et al., 2024)

The selection of materials plays a critical role in the quality and environmental impact of the handmade paper produced. This study utilised a variety of textile fibres, including spandex, cotton, silk, and canvas, all sourced from discarded clothing items. These materials were chosen to reflect the project's commitment to sustainability by reusing textile waste. Lycra, a synthetic fibre known for its exceptional elasticity, was selected for its versatility in fabric-based applications. Cotton and silk, both natural fibres, were chosen for their inherent softness, breathability, and high absorbency, which contribute to the strength and durability of the paper. Canvas, a densely woven fabric typically made from cotton, was selected for its robustness and water-resistant properties, which enhance the paper's overall durability. Additionally, methyl cellulose was used as a binding agent due to its hydrophilic nature, which allows it to dissolve in cold water and form a viscous solution, thereby enhancing fibre bonding in the pulp. Its non-toxic, non-allergenic, and biodegradable properties make it an ideal choice for eco-friendly paper production.

4.2 Process

The handmade paper production process involves several meticulously planned steps, each designed to optimise material use and ensure a high-quality final product. The process is outlined as follows:

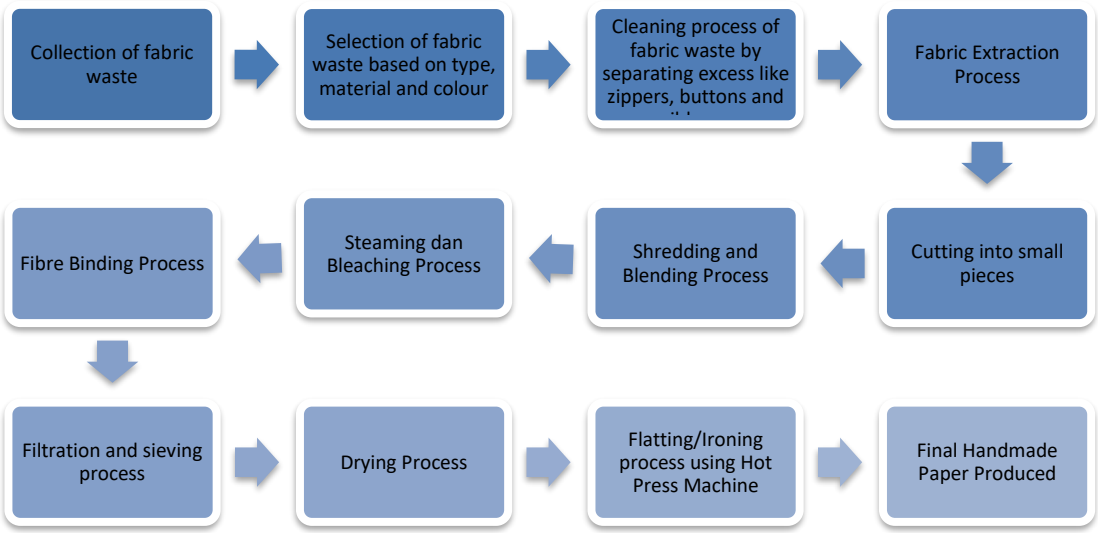


Fig. 2. The process of handmade papermaking.
(Source: Yahaya et al., 2024)

4.2.1 Fibre Preparation

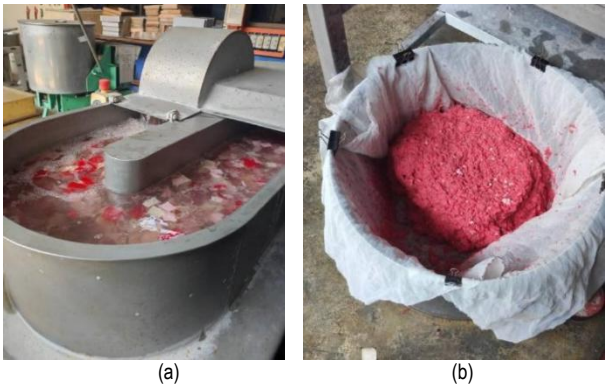
The process begins with the careful preparation of textile fibres. Selected fibres, such as cotton, silk, and canvas, are cut into small, uniform pieces using scissors. This size reduction is crucial for achieving a homogeneous pulp and producing smooth, high-quality paper.

(a) (b)

Fig. 3. (a) Fabrics cut into small pieces; (b) Weighing the fabrics.
(Source: Yahaya et al., 2024)

4.2.2 Pulp Formation

The cut fibres are then processed in a Hollander beater, designed explicitly for pulping cellulose-based materials. The beater's action effectively separates the fibres and mixes them with water to create a pulp slurry. The consistency of the pulp is a critical factor as it directly influences the texture and strength of the final paper product.



(a) (b)

Fig. 4. (a) Cut fabrics are processed in a Hollander beater; (b) Fabrics Pulp.
(Source: Yahaya et al., 2024)

4.2.3 Sheet Formation

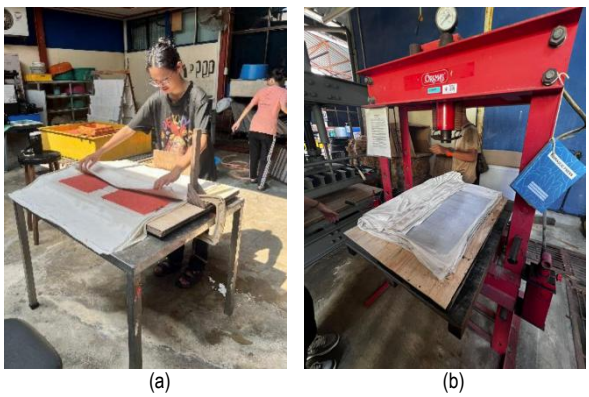
The pulp is poured into a vat containing a pre-prepared methylcellulose solution in the next stage. A deckle is used to draw out sheets from the pulp mixture, with the deckle's frame determining the size and thickness of each sheet. Excess water is carefully drained, and the wet sheets are transferred to an absorbent surface through a process known as couching. Precision is required at this stage to prevent the formation of air bubbles, which can compromise the smoothness of the paper.

(a) (b)

Fig. 5. (a) Mix with methyl cellulose and scraped cloth; (b) Pour a thin pulp layer onto the screen-covered frame.
(Source: Yahaya et al., 2024)

4.2.4 Pressing

Once the sheets are formed, they undergo pressing to remove excess water and ensure uniform thickness. The sheets are placed between layers of absorbent cloth and subjected to pressure in a hydraulic paper press. This step not only enhances the paper's strength but also shortens the drying time, thereby improving the overall energy efficiency of the process.



(a) (b)

Fig. 6. (a) Place between layers of cloths; (b) Press using hydraulic paper press.
(Source: Yahaya et al., 2024)

4.2.5 Drying

The pressed sheets are dried by carefully peeling them from the cloth and transferring them to a wooden board for air drying. This natural drying process typically takes one to two days, allowing the paper to develop its final texture and strength without additional chemicals.

(a) (b)

Fig. 7. (a) Transfer press sheets on wooden board; (b) Natural drying process.
(Source: Yahaya et al., 2024)

4.2.6 Finishing and Final Application

The final stage of the process involves inspecting and finishing the dried paper. Unlike industrial paper-making processes often involving bleaching and other chemical treatments, this study's handmade paper retains the original fibres' natural colour and texture. The results yielded a collection of 50 handmade sheets consisting of 45 A3-sized sheets and 5 B5-sized sheets. Each sheet exhibited unique variations, reflecting the natural irregularities of the fibres, which contributed to the overall aesthetic diversity of the collection. This variation not only highlights the artistic potential of handmade paper but also aligns with the study's broader objective of promoting eco-friendly alternatives in paper production. Furthermore, the decision to forego bleaching and chemical treatments demonstrates the viability of producing aesthetically appealing and functionally durable paper without compromising environmental sustainability. The findings from this phase underscore the potential for handmade paper to serve as a sustainable alternative to conventional paper, particularly in contexts where environmental impact and aesthetic quality are paramount. This collection of sheets, with its distinct textures and natural tones, serves as evidence of the success of a more environmentally responsible approach to papermaking, thus contributing to the body of knowledge in sustainable materials research and eco-friendly design practices.

Fig. 8. Handmade Paper with A2 size and B5 size sheets.
(Source: Yahaya et al., 2024)

5.0 Discussion

The production of handmade paper from synthetic fibres demonstrated the feasibility and numerous advantages of utilising alternative materials in sustainable crafts. This process encompassed several critical steps, including fibre preparation, pulp formation, sheet creation, and pressing, each of which played a pivotal role in determining the overall quality of the final product. The selection of synthetic fibres, such as lycra, cotton, silk, and canvas, provided a durable and flexible foundation for the paper, expanding its applicability beyond traditional uses and into innovative craft applications. Incorporating methyl cellulose as a binding agent was instrumental in ensuring the paper's structural integrity, underscoring the importance of selecting appropriate chemical agents in the papermaking process.

From a technical standpoint, the handmade paper exhibited desirable characteristics, including strength, elasticity, and a pleasing texture. These qualities resulted from meticulous execution at every stage of the process, highlighting the importance of precision in sustainable papermaking. The decision to utilise recycled materials, including discarded clothing and food packaging, was in direct alignment with the project's sustainability objectives. This approach not only contributed to waste reduction but also actively promoted the principles of the 3R concept—Reduce, Reuse, and Recycle—thereby reinforcing the project's commitment to environmental stewardship. This study effectively demonstrated how handmade paper can be employed innovatively, contributing significantly to the broader field of sustainable design. Moreover, integrating natural and recycled materials in the design process highlighted the potential for eco-friendly products to meet consumer demands for both sustainability and quality.

6.0 Conclusion and Recommendations

In conclusion, this study explored the potential of producing handmade paper from synthetic fibres and its application in creating functional and artistic products. Transforming recycled materials into handmade paper demonstrated the viability of integrating sustainable practices into the craft industry. The successful creation of a table lamp as the final product illustrated handmade paper's versatility and aesthetic potential, proving that waste materials can be effectively repurposed into valuable, eco-friendly items.

This study met its objective of combining artistic expression with environmental consciousness and provided a robust framework for future sustainable design and innovation explorations. The findings suggest that with careful material selection and process management, handmade paper can play a pivotal role in developing sustainable products, contributing to environmental stewardship, and promoting sustainable living. The work conducted in this study opens avenues for further research and development, encouraging the continued pursuit of innovative solutions that align with the principles of sustainability in craft and design industries.

Acknowledgements

The authors would like to extend their deepest gratitude to the School of The Arts, Universiti Sains Malaysia (USM), for their invaluable support throughout this study. The provision of institutional resources, guidance, and facilities significantly contributed to the successful completion of this study.

References

Tang, Kuok Ho Daniel. (2023). State of the Art in Textile Waste Management: A Review. *Textiles* 3, no. 4: 454-467. https://doi.org/10.3390/textiles3040027

Kasavan, S., Yusoff, S., Guan, N. C., Zaman, N. S. K., & Fakri, M. F. R. (2021). Global trends of textile waste research from 2005 to 2020 using bibliometric analysis. *Environmental Science and Pollution Research*, *28*, 44780-44794.

Stanescu M. D. (2021). State of the art of post-consumer textile waste upcycling to reach the zero waste milestone. *Environmental science and pollution research international*, *28*(12), 14253–14270. https://doi.org/10.1007/s11356-021-12416-9

Bernama (2022). Melaka SWcorp to set record by collecting 40 tonnes of fabric waste in 24 hours. The Vibes.com

Bernama (2023). Saving the environment one dress at a time. The Malaysian Reserves. https://themalaysianreserve.com/2023/09/18/saving-the-environment-one-dress-at-a-time/

Arafat, K., Nayeem, J., Quadery, A., Quaiyyum, M., & Jahan, M. S. (2018). Handmade paper from waste banana fibre. Bangladesh Journal of Scientific and Industrial Research, 53(2), 83–88. https://doi.org/10.3329/bjsir.v53i2.36668

Ütebay, Burçin & Celik, Pinar & Cay, Ahmet. (2020). Textile Wastes: Status and Perspectives. 10.5772/intechopen.92234.

Textile Exchange. Preferred Fibre & Materials, Market Report. (2022). Available online:https://textileexchange.org/knowledge-center/reports/materials-market-report-2022/ (accessed on 8 January 2024).

Diah, N. M., Ismail, M., Ahmad, S., & Mahmud, M. I. (2012). Adaptation of environmental anticipation in educational computer game. Procedia-Social and Behavioral Sciences, 42, 74-81.

Reyyan Dogan (2024). Transforming Textiles Into Bricks: FabBRICK. Parametric Architecture. https://parametric-architecture.com/transforming-textiles-into-bricks-fabbrick/#google_vignette

Singh S, Rani J. (2021) Traditional Indian Textile Techniques Used to Upcycle and Recycle Textile Waste. Textile & Leather Review. https://doi.org/10.31881/TLR.2021.29

Jain, M. I. N. A. K. S. H. I. (2018). Challenges for sustainability in textile craft and fashion design. *Int. J. Appl. Home Sci*, *5*, 489-496.

Pareek, A., & Ojha, S. (2023, July). Integrating Upcycling Approach Using An Indigenous Textile Weaving Craft. In *International Conference on Emerging Trends in Design & Arts* (Vol. 4, No. 2SE, pp. 188-193).

Jain, P., & Gupta, C. (2021). A Sustainable Journey of Handmade Paper from Past to Present: A Review.(2), 234–244.

Gvoka, T., Vladić, G., Kašiković, N., Maričić, K., Bošnjaković, G., & Adamović, S. (2023). The Utilization Of Waste Textile Materials In The Packaging Production. Union of Engineers and Textile Technicians of Serbia.

Bakri, M., & Hasyim, H. (2024). Training on Making Crafts from Perca Fabric to Improve the Economy of PKK Manimbahoi Village. *Advances in Community Services Research*, *2*(2), 87-97.

James, A., & Nagasaka, D. (2011). Theoretical connection points between multimedia and architecture. Journal of Asian Architecture and Building Engineering, 10(1), 171-178.

Kamil, M. J. M., & Abidin, S. Z. (2013). Unconscious human behavior at visceral level of emotional design. Procedia-Social and Behavioral Sciences, 105, 149-161.

King County Linkup (2014). Post-consumer textiles: King County linkup research summary report. Retrieved from http://your.kingcounty.gov/solidwaste/linkup/documents/textiles-research- summary .pdf

Latif, S. A., Bidin, Y. H., & Awang, Z. (2013). Towards the realization of green cities: The moderating role of the residents' education level. Procedia-Social and Behavioral Sciences, 85, 646-652.

Latif, S. A., Omar, M. S., Bidin, Y. H., & Awang, Z. (2012). Environmental values as a predictor of recycling behaviour in urban areas: A comparative study. Procedia-Social and Behavioral Sciences, 50, 989-996.

Muhammad Saufi Hassan, Nor 'Asyikin Mat Hayin, Muhamaad Razis Ismail dan Nurul Husna Mahmud, (2021). Sampah Makin Banyak. Harian Metro, Julai 18,

Nakano, Y. (2007). Perceptions towards clothes with recycled content and environmental awareness: The development of end markets. Newcastle Upon Tyne, UK: Centre for Design Research, Northumbria University.

Niitamo, V. P., Kulkki, S., Eriksson, M., & Hribernik, K. A. (2006). State-of-the-art and good practice in the field of living labs. Paper presented at the Proceedings of the 12th International Conference on Concurrent Enterprising: Innovative Products and Services through Collaborative Networks. Italy: Milan.

Pang, Y. L., & Abdullah, A. Z. (2013). Current status of textile industry wastewater management and research progress in Malaysia: A Review. Clean-Soil Air Water, 41(8), 751-764. doi: 10.1002/clen.201000318

Pompelia, M. (2012). Texture and materiality: Creating a new material resource center at RISD. VRA Bulletin, 38(2), 3. *Problemy Ekorozwoju*, *16*

Reis, J. M. L. d. (2009). Effect of textile waste on the mechanical properties of polymer concrete. Materials Research, 12(1), 63-67.

Sinha, Pammi, Dissanayake, D. G. K., Hussey, Clare, J. and Bartlett, Caroline (2009) Recycled Fashion. In: Taking up the Global Challenge: 15th Annual International Sustainable Sustainable Development Research Conference, 5-9 July 2009, Utrecht University, the Nethelands. .
Wang, Y. (2006). Recycling in textiles. North America, USA: Woodhead Publishing in Textiles. Yusup, A. R. M. (2014). Turning the tables on cast-offs. New Straits Times.

Young Lee, J., Halter, H., Johnson, K. K., & Ju, H. (2013). Investigating fashion disposition with young consumers. Young Consumers, 14, 67-78.

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Remove the Asphalt Paving: De-Modernism

Yusaku Imamura

Global Art Practice, Graduate School of Fine Arts,
Tokyo University of the Arts, Tokyo, Japan

imamura.yusaku@fa.geidai.ac.jp
Tel: +815055252589

Abstract
This study explores the urgent need to shift our understanding of sustainability from a human-centered perspective to one that recognizes our interconnectedness with the Earth. It critiques modernity's focus on material wealth and advocates for a transformative worldview that values ecological balance. The paper emphasizes fostering community engagement and sensibility towards the environment by integrating interdisciplinary approaches, critical reflection, and artistic expression. Ultimately, it calls for a profound re-evaluation of our relationship with nature, urging a collective commitment to reimagine our place within the ecosystem and cultivate ecological and cultural "soil" for future generations.

Keywords: Non-human; symbiosis; de-modernism; sustainability

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6179

1.0 Introduction

In employing the term "sustainability," it is crucial to critically examine what we aim to sustain. I approach this term cautiously, as it often carries a tone of hubris, suggesting an intent to perpetuate our prosperity. However, if sustainability is understood not as preserving human abundance but rather as safeguarding a planet in peril, then its usage is justified. However, it is for terminology highlighting our responsibility to maintain the Earth—a planet of inherent abundance—and promote a harmonious coexistence. Our focus should be on sustaining the globe and fostering a balance between human life and the longevity of the Earth.

Humans are often driven by the pursuit of monetary and material wealth, exploiting the Earth for profit and development. However, we fail to grasp the gravity of the Earth's precarious state fully. The Earth's crisis is inherently our crisis. This necessitates a fundamental reassessment of the affluence we unthinkingly chase and reconsider our way of life. Living in the modern world is akin to walking on a road paved with asphalt, oblivious to the soil and Earth's crust beneath our feet.

Stripping away this metaphorical asphalt is essential for achieving true sustainability. The asphalt, a symbol of modernism, prompts us to question: How can we deconstruct modernism? This task is fraught with challenges, including the dangers of nostalgia, romanticism, historicism, and patriotism. Is it possible to unlearn modernity without succumbing to these pitfalls? How can we distance

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6179

ourselves from the influences of modernity, Western-centric perspectives, and neoliberalism? Moreover, how can we liberate ourselves from the allure of modern affluence?

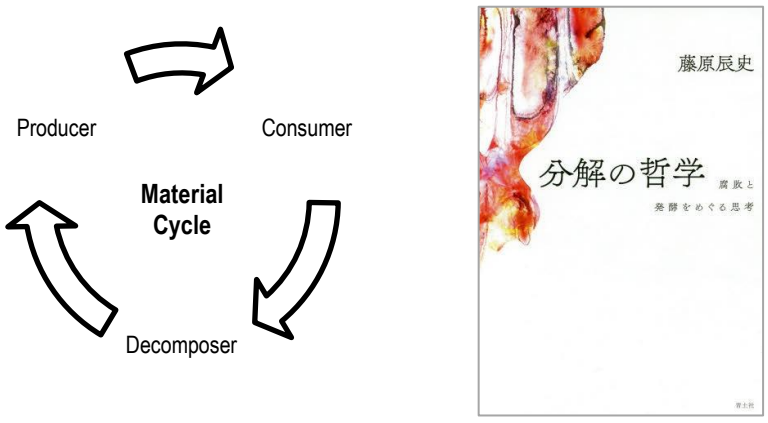
2.0 Literature Review

To talk about soil now is to talk about where we stand and our future. It is a move away from a perspective that has been fragmented, simplified, and favored by utilitarian systems in the name of modernity and production and towards a worldview of multi-perspective work and engagement. The COVID-19 pandemic began in 2020 and has reversed the capitalist or neoliberal idea of faster, more, and further. This has been ingrained in our consciousness, like an obsession. Faster, more, and further to beat the competition. It has become the norm to internationalize for the world market, to fly abroad in our spare time, and to use technology to transmit and spread images and information, not substance, around the world. However, prolonged lockdowns and other factors have restricted our activities, and we live in a world of individuals, families, and neighborhoods. In doing so, we have rediscovered something important in our immediate world that had been forgotten: the slowness, the staring, the gaze, the touch (tactile, tangible).

My gaze went to the soil, to the days when I could slowly watch the plants sprout, flower, bear fruit, and then wither, preparing for the next life. This is where I stand, this is where I live and think, the horizon, the ground, whatever you want to call it, this is where I stand, on the earth. I am standing here on the earth, and I live on the food that the earth gives me. I am alive because of my relationship with the land and the soil on which I stand. However, we do not know much about the soil, even though we receive information from all over the world daily on social media. So, when I turned my attention to the soil, I was surprised by the richness of this world and learned that the perspective from the soil can shake the formation of the world and even epistemology itself. By looking at the soil, I saw the hidden half of the world I had not been looking at.

Soil may appear inorganic, but it is home to countless microorganisms. The invention of the microscope in the 18th century led to the scientific recognition of microorganisms. In the late 20th century, the diversity and function of microorganisms in soil became the focus of much attention. Massive research has identified less than 1% of micro-organisms, providing a new perspective on global biodiversity (Madigan et al., 2019). The soil was created by weathering rocks into fine rock particles, which were transformed into the soil by water, organic matter, and atmospheric microorganisms. Soil is not only the solid phase of sand and clay but also contains water and air, and the plants and trees that grow in the soil secrete organic matter that dissolves the rocks below. Those rocks become differentiated, micro-organisms are activated, humus accumulates, and new soil is created.

Plants produce oxygen from the sun, water, and carbon dioxide and absorb inorganic elements as nutrients from their roots. Animals breathe in the oxygen plants produce and consume plants for their nutrition. Plants and animals return to the soil in the form of fallen leaves and bodies, which microorganisms decompose to produce inorganic elements within the soil once again. This is called the 'material cycle'; soil is a critical stage. The micro-organisms living in the soil are called 'decomposers' or 'reducers,' while plants, which produce organic matter, are sometimes called 'producers' and animals, 'consumers.' The cycle of life initiated by soil microorganisms is sometimes referred to as the 'detritus food chain (humus chain)' (Tatsushi, 2019).



(a) (b)

Fig. 1. (a) Material Cycle; (b) Bunkai No Tetsugaku Fuhai to Hakko Wo Meguru Shiko book.
(Source: Tatsushi, 2019)

The great cycle of life, from the death of an organism to the creation of new life, begins with the micro-organisms in the soil. We live in this extended, slow circle of life processes to which we are utterly oblivious in our daily lives. We buy food in convenience stores for quick energy and take vitamins when we need more nutrition. We do not work within a vast cycle but in a utilitarian, one-to-one way. Nevertheless, many people escaped the hustle and bustle during the pandemic, went into the woods, grew crops in their small gardens, and started baking bread at home. The gardening section of the local home improvement center was bustling with activity. It may seem small, but many insights come naturally when we let off the gas a little in our driven lives.

3.0 Methodology

This study employs an interdisciplinary framework that synthesizes insights from environmental science, sociology, philosophy, and art to cultivate a nuanced understanding of sustainability challenges. The theoretical framework incorporates principles from ecological philosophy, the Anthropocene concept, and critiques of modernity, aligning them with artistic practices. The methodology unfolds in three core steps:

1. Critical Reflection: The study engages in a comprehensive critique of preconceived notions of modernity and its impact on sustainability. This involves deconstructing dominant paradigms such as neoliberalism, materialism, and anthropocentrism, using an ecological lens to reveal their limitations.
2. Artistic Exploration: Artistic expression functions as both a medium and a method for exploring and conveying the interconnectedness between humans and the environment. Through installations, visual narratives, and community art projects, the study brings abstract sustainability principles into tangible, relatable forms that resonate with diverse audiences.
3. Comparative Analysis: The research juxtaposes ecological philosophies, such as symbiogenesis and mutual aid, with anthropocentric frameworks, highlighting the shifts necessary for a systemic rethinking of humanity's place within Earth's ecosystems. Field observations and studies of soil ecosystems serve as empirical evidence, grounding theoretical constructs in observable realities.

These methodologies aim to uncover the intricate relationships that define our ecosystem, emphasizing the need for a paradigm shift from dominance over nature to symbiosis with it.

4.0 Findings

The study of soil and soil micro-organisms reminds us of the diversity of life on Earth and the extraordinary life cycles. It is unnecessary to name the many lives, inorganic things, agents, and actors that make up the world in myriad relationships. We live in a place and an environment; as Kitaro Nishida said, "I am a place" (Nishida, 1987). The number of cells in our organism is said to be 60 trillion, but the number of bacteria and micro-organisms in our bodies is over 100 trillion (Sender et al., 2016). We do not exist only as individuals; we already live with many others. I exist in this duality of others and myself.

Recent research has pointed out many similarities between plants and us humans (Fig. 2), such as the structure of the intestine and the underground stem and roots of plants (Jacoby et al., 2017). Our gut is like a plant root structure turned inside out, and we take in nutrients from the gut just as plants take in nutrients from the soil. Our bodies take in nutrients broken down by micro-organisms living in the gut, just as plants take in inorganic substances differentiated by micro-organisms in the soil.

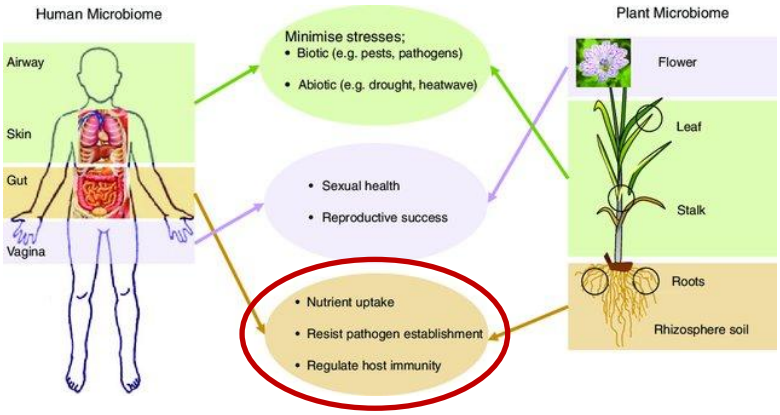


Fig. 2. Similarities between plant and human; comparison the structure of the intestine to the underground stem and roots of plants.
(Source: Singh, B. K. et al., 2018)

Studies of the DNA of trees have shown that in aged trees, the genetic sequences of the branches are frequently diversified as if each branch had its own genetic information. This is why botanists say trees are colonies rather than single organisms (Clément, 2015).

Microbiologist Lynn Margulis, known for co-developing the Gaia Hypothesis with James Lovelock in the 1970s, focused on 'symbiogenesis,' a term coined by a Russian biologist in the 1910s, and argued that cooperation, interdependence, and mutual aid are the driving forces behind evolution, as opposed to classical evolutionary theory, which focused on competition as the driving force (Margulis, 1999). She proposed that symbiotic relationships between micro-organisms are the basis of multicellular organisms and that mutually supportive relationships are the key to the origin of life. Higher life forms evolved when one cell took in another cell and kept it alive.

This is a significant paradigm shift for those of us who have studied and believed in the 'competitive' cycle of life in the theory of evolution. However, this theory may be somewhat familiar to those who have studied anarchism. Kropotkin's 'mutual aid' theory, which contributed significantly to the theoretical development of anarchism, was derived from his research in Siberia, where he was also a biologist (Kropotkin, 1902). Even though Darwin himself mentioned the importance of interdependence in The Descent of Man, which followed On the Origin of Species, Darwinists "assumed the primitive man to be a beastly creature who survived by snatching the last

scrap of food from his neighbor's hand *by tooth and claw*" (Bowler, 1992) Kropotkin criticized Darwinists such as Herbert Spencer, who replaced the theory of natural selection proposed in Darwin's On the Origin of Species with the competitive principle of 'survival of the fittest' and applied it to sociology and ethics. This view of life may have much to do with the Victorian era when those ideas dominated the world economy (Graeber, 2015). Kropotkin's theory of mutual aid, which the world's scholars widely recognized at the time, was the basis of his theory of anarchism, linking the nature of the life system to that of the community and the political system. This led to anarchist anthropologist David Graeber's reconceptualization of anarchism as 'anarcho-communism.' During his research, Graeber observed an interesting phenomenon in a village in Madagascar. The central government was still in place but had effectively withdrawn its control, yet the rural community was practically self-governing. It has been thought that when a human being suffers a breakdown in the social system or a natural disaster or war, panic sets in, and the wicked nature of man is exposed, with no regard for others. However, recent research suggests that this does not happen and that man's capacity for mutual aid comes to the fore (Graeber, 2004). In Japan, we have seen the power of community and the mutual support of others in the aftermath of repeated earthquakes. There is a reaffirmation of the inherent mutual support and survival of humans and organisms, which also leads to a reaffirmation of anarchism.

The ideas of mutual aid and symbiogenesis have also been considered deeply in Buddhist thought. Buddhism sees the phenomena of the living system as it is, denies the ego-generated 'I' and its fixed worldview, and invites us to free ourselves from its confinement. The Vietnamese Buddhist monk Thich Nhat Hanh, who taught Buddhist thought and practiced in his translation of Western ideas, describes the nature of the world as 'inter-being,' aiming to liberate us from the problems of anxiety arising from the obsession with the 'I.' This is an essential concept because it includes the dependent aspect of inter-dependency and the spontaneous aspect of existence and life itself.

Just as a piece of paper is the fruit, combining many elements called non-paper elements, the individual is made of non-individual elements. If you are a poet, you can see a cloud floating on this sheet of paper. Without a cloud, there will be no water; without water, the trees cannot grow; without trees, you cannot make paper. So the clouds are in here. The existence of this page is dependent on the existence of a cloud. Paper and cloud are so close. Let us think of other things, like sunshine. Sunshine is essential because the forest cannot grow without sunshine, and humans cannot grow without sunshine (Hanh, 1987).

As David Montgomery and Anne Bikle observe in The Hidden Half of Nature: The Microbial Roots of Life and Health (Montgomery & Biklé, 2015), the realization that microbial partnerships are common and essential is reshaping how we see our relationship with the hidden half of nature. Turning our gaze on soil and microbes invites us to a new epistemology of the world. This impact is similar to the mindset shift in the early 20th century triggered by the microscope, which revealed the previously unknown structure of cryptogam plants and showed that they are not inferior to the structure of flowering plants. Kumagusu Minakata's (Kumagusu, 2015) fascination with slime mold (Fig. 3), which is neither a plant nor an animal, led him to develop his view of life and the world. He was searching for a new theory of life rooted in East Asian ideas, and we continue to grapple with his questions about the kind of world we construct from the study of nature and our views on life.

Fig. 3. Dog Vomit Slime Mold.
(Source: Koskinen, H., in George, S. C., 2023)

5.0 Discussion and Conclusion

Since modern times, art, culture, and education have been described and theorized using the production metaphor. This view of the world from the soil, from the hidden half of the world where the living system is not visible, is also a shift from the perspective of production to development. There, we gain a new perspective that is not based on superstition, fabricated traditions, history, or utilitarian science. In the world's capitalist vision, economic activity matters, and production, not generation, is what counts. However, if we think about life, we can see that generation is most important. Life is not something that can be produced. Creation and education should be reconsidered from the logic of generation, not from the logic of production. Life exists within a cycle of birth and death, decomposition and fermentation. What has been abhorred and avoided as rubbish or putrefaction is merely the result of a narrow perspective. Putrefaction and fermentation are the transformation of materials by microorganisms, but what is seen as beneficial to human beings is called

fermentation, and what is harmful is called putrefaction. It is important to watch closely whether our education brings about decay or fermentation.

For those of us living in Japan, the Great Hanshin-Awaji Earthquake of 1995 and the Great East Japan Earthquake of 2011 remain not just memories but have shaken the landscape of how we see the world. Both the images on the TV news and reality itself surpassed our imagination. The disasters served as reminders that the forces of nature are beyond our control and that the attempt to complete the world through human power since modern times has been reckless. In Japan, there was talk of the need for a significant shift in thinking, but that conversation faded ten years after the Great East Japan Earthquake (Nakazawa, 2011). In 2011, the concept of the Anthropocene was already being proposed, pointing out that human activities are having a significant impact on the planet at a global scale. The frequency of disasters caused by extreme weather and climate change has led many sociologists, anthropologists, philosophers, and scientists to propose new ways of thinking about the world. Many of them have begun to argue for the importance of moving away from the human-centered view of the world to a view of the world from the perspective of the Earth itself, from the perspective of a living organism that is separate from the human world.

How can we demodernize our understanding of humanity and broaden our perception to include the latent yet interconnected agencies and environments, such as the soil that sustains us? Bruno Latour once enthusiastically proposed the necessity of "composting" (Fig. 4) the etymology of our ontology, suggesting a profound shift in how we conceive of ourselves; “It is perhaps time, in order to stress this point, to stop speaking about humans and to refer instead of terrestrials (the Earthbound), thus insisting on humus and, yes, the compost included in the etymology of the word human” (Latour, 2017).

Fig. 4. Composting.
(Source: ECEPL, 2024)

The future of humanity hinges on our ability to unlearn modernity and adopt a new, planetary perspective—one that transcends the pitfalls of nostalgia and nationalist ideologies that have unconsciously shaped our worldview. The wisdom and philosophy of the East may offer a valuable lens through which we can imagine our relationship with the Earth and others. With the Sustainable Development Goals for 2030 now less than six years away, is it not imperative to move beyond mere revisionism and pragmatic coping strategies and fundamentally alter our human-centered worldview?

Ichiro Endo, who identifies himself as a "future artist" and often embodies the mythical Kappa when engaging with society, once shared his guiding philosophy for life with me. “To be human, you must not be human (Endo, 2020).” This paradoxical manifesto perfectly illustrates our current situation, where it is crucial to have a different point of view, a view not only of nature and the earth but also of existence outside ourselves.

In conclusion, this study calls for a fundamental re-evaluation of our understanding of sustainability and our relationship with the Earth —the soil itself. It highlights the lingering impact of a modern, human-centered worldview on our ecological sensibilities and modalities of thinking that prioritize economic growth and material wealth over the ecological equilibrium of the environment we inhabit. By fostering a deeper awareness of our interconnectedness with the environment, we can begin to unlearn the habits and ideologies that have led to ecological degradation. It calls for interdisciplinary approaches incorporating insights from various fields, encouraging critical reflection and community engagement to develop sustainable practices that honor life cycles. Only by embracing a planetary perspective that transcends the paralyzing constraints of nostalgia and nationalism can we cultivate a mode of existence that aligns with the Earth’s rhythms. A sustainable future demands nothing less than a radical overhaul of our worldview—one that decisively shifts from exploiting the planet to safeguarding its ecological integrity for future generations.

Acknowledgments

I am grateful to Tyuki Imamura, a DPhil candidate at the University of Oxford, for his invaluable assistance in formulating this article.

Paper Contribution to Related Field of Study

This paper redefines sustainability by shifting the focus from human-centered prosperity to ecological health, critiquing modernity's materialism and advocating for de-modernization. It bridges art, philosophy, and environmental science to promote regenerative

practices, benefiting policymakers, educators, and communities by offering innovative frameworks for sustainable development and environmental engagement.

References

Bowler, P. J. (1992). The Eclipse of Darwinism: Anti-Darwinian Evolution Theories in the Decades around 1900. In *The Eclipse of Darwinism*. Johns Hopkins University Press. https://doi.org/10.56021/9780801829321

Clément, G. (2015). *Ugoiteiru Niwa – Le Jardin En Mouvement, Translated by Tomoki Yamauchi* (T. Yamauchi, Trans.). Misuzu Shobo. https://www.lespressesdureel.com/EN/ouvrage.php?id=4523&menu=0

ECEPL. (2024). Organic Composting: A Sustainable Solution for Waste Management and Soil Health. https://www.ecepl.com/organic-composting-a-sustainable-solution-for-waste-management-and-soil-health/

Endo, I. (2020). *Endo Ichiro-ARTIST | Art Sightama 2020*. https://art-sightama.jp/en/artist/uFoQfN2b/

Graeber, D. (2015). *The Utopia of Rules: On Technology, Stupidity, and the Secret Joys of Bureaucracy*. Melville House printing.

Graeber, D. (2004). *Fragments of an Anarchist Anthropology*. Prickly Paradigm Press. www.prickly-paradigm.com

George, S. C. (2023). What Is Slime Mold? https://www.discovermagazine.com/planet-earth/what-is-slime-mold

Hanh, T. N. (1987). *Being Peace*. Parallax Press.

Jacoby, R., Peukert, M., Succurro, A., Koprivova, A., & Kopriva, S. (2017). The role of soil microorganisms in plant mineral nutrition—current knowledge and future directions. *Frontiers in Plant Science*, *8*, 292271. https://doi.org/10.3389/FPLS.2017.01617/BIBTEX

Kropotkin, P. (1902). *Mutual Aid: A Factor of Evolution*. McClure Phillips & Co.

Kumagusu, M. (2015). *Minakata Mandala – Minakata Kumagusu Collection –, Edited by Shinichi Nakazawa*. Kawade Shobo Shinsha. https://www.abebooks.com/Minakata-Kumagusu-Collection-1-Mandala-Author/31660917581/bd

Latour, B. (2017). *Down to Earth Politics in the New Climatic Regime* (C. Porter, Trans.). Polity Press. https://lccn.loc.govhor8oo9

Madigan, M., Bender, K., Buckley, D., Sattley, W. M., & Stahl, D. (2019). Brock Biology of Microorganisms. In S. Beauparlant (Ed.), *Pearson* (15th ed.). Pearson education Lmtd.

Margulis, L. (1999). *The Symbiotic Planet: A New Look at Evolution*. Basic Books.

Montgomery, D. R., & Biklé, A. (2015). *The Hidden Half of Nature: The Microbial Roots of Life and Health*. W. W. Norton. https://wwnorton.com/books/The-Hidden-Half-of-Nature/

Nishida, K. (1987). *Tetsugaku Ronshu* (S. Ueda, Ed.). Iwanami Shoten. https://philpapers.org/rec/NISNKT-2

Nakazawa, S. (2011). *Nihon No Daitenkan*. Shueisha.

Sender, R., Fuchs, S., & Milo, R. (2016). Revised Estimates for the Number of Human and Bacteria Cells in the Body. *PLOS Biology*, *14*(8). https://doi.org/10.1371/JOURNAL.PBIO.1002533

Singh, B. K., Trivedi, P., Singh, S., Macdonald, C. A., & Verma, j. P. (2018). Emerging microbiome technologies for sustainable increase in farm productivity and environmental security. Microbiology Australia 39(1) 17-23 https://doi.org/10.1071/MA18006

Tatsushi, F. (2019). *Bunkai No Tetsugaku Fuhai to Hakko Wo Meguru Shiko*. Seidosha. https://www.cdjapan.co.jp/product/NEOBK-2375731

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institut Seni Indonesia, Yogyakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Colouring Space in Virtual Reality: A-Chromatic and chromatic composition and color saturation affecting visual perception

Yulyta Kodrat P[1*], Mutia Nurdina[2], Rafeah Legino[3]
**Corresponding Author*

[1] Interior Design Study Programme, Faculty of Visual Art Institut Seni Indonesia Yogyakarta, Yogyakarta, Indonesia
[2] Media Design Study Program, Faculty of Visual Art Institut Seni Indonesia Yogyakarta, Yogyakarta, Indonesia
[3] College of Creative Arts, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

yulyta_kodrat@isi.ac.id; mutianurdina@isi.ac.id; leginorafeah@gmail.com
Tel: +6281904138654

Abstract
Interior design is one field that employs three-dimensional perspective presentations to illustrate space. This study investigated the variations in colour composition and saturation affecting visual impressions. The method tests the three-dimensional rendering of images through virtual reality (VR). The variables connect to the differences in room and furniture colour composition. The visual simulation test conducted on two experiments included 20 participants who replied to a group of chromatic-achromatic and achromatic-chromatic, with saturation levels ranging. The findings reveal that colour composition impacts the clarity of space, and the variation in colour saturation influences the impression of the room's depth.

Keywords: Virtual reality; colour saturation; chromatic; achromatic

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6148

1.0 Introduction

In the past decade, virtual Reality (VR) has seen rapid expansion. VR products in cyberspace allow us to visit and experience the ambience of tourist spots worldwide and explore interior developments using this technology. But what exactly is virtual reality? It is a technique that transforms real-world views into virtual 3D graphics. Designers can utilise visual reality to improve comprehension of the built environment; the process of representation and interpretation can be viewed as an act of knowledge production or as a type of complicated reasoning (Bosselmann, 1999; Macheachren, 1995) in (Whyte, 2002). In simpler terms, VR allows us to create and interact with virtual environments that mimic real-world settings. This understanding of VR is crucial to grasp the potential it holds for interior design and architecture.

The field of design, mainly interior design, can benefit from this VR technology as a medium for presenting concepts and designs to clients. Although most Indonesian interior designers are more accustomed to using 3D animation media and visual presentations such as 3D Max or Sketchup, presenting using VR is also an alternative. VR technology is an animated rendering advancement that allows users to interact with and feel the atmosphere of the interior as if they were in the real world. Because consumers can sense the mood

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6148

in the area, the interior appearance becomes more distinct and appealing. Through VR, the user may move his head around the space, feeling proportion, material, colour, and light in great detail. VR is a headset-mounted device that is connected to the user's eyes. Users can view the inside room and the objects exhibited by the device projector using this feature.

Interior designers typically employ 2D, 3D, and 3D animation rendering images for internal modelling. Because presenting 3-D animation necessitates a huge file and a lengthy rendering time, one of the advances in the usage of 3D rendering packaged in 360 º and shown in VR has a quality comparable to 3D animation. Interior modelling that can only be seen with the naked eye looks very different when viewed through VR. As a result, colour and light element configurations play an essential part in displaying a perspective that appears in volume, exhibiting the depth of space, three-dimensional objects, material details, and textures.

The biggest challenge in displaying 3D modelling with VR is producing three-dimensional graphics close to actual visuals. The use of shading is an essential aspect of 3D modelling for VR. A colour saturation configuration scheme and lighting contrast setup are required for virtual reality (VR) interior modelling. This study aims to test interior modelling using various colour saturation and light contrast settings in virtual reality (VR) to determine how the configuration impacts visual perception.

2.0 Literature Review

2.1 Virtual Reality

Shields (2005) describes "virtual" is frequently used to denote absence, unreality, or non-existence. Virtual is an authentic experience without the exact, ideal without the abstract. Furthermore, *virtual reality* is defined as VR media or VR systems. Whyte (2002) emphasises virtual environments and models made within computers. Immersive virtual reality has been identified as a valuable interior design and architecture method. Paes, Arantes, and Irizarry (2017) conducted a study to quantitatively validate the capabilities of specific immersive systems to provide users with a better spatial knowledge of virtual mock-ups. This method contrasts users' spatial awareness when utilising traditional workstations against immersive platforms. The study concludes that immersive settings can improve professional understanding of the spatial organisation of virtual models, which can assist existing design methods. When utilised for different objectives, different styles of exhibits generate distinct sets of explicit knowledge about the natural world (Whyte, 2002). Zhang's finding (2019) has revealed the concept, characteristics, mode of expression, scope of application, and basic types of virtual reality display design which can be achieved through the perspective of three-dimensional (3D) virtual reality technology to achieve the most intuitive display of interior design effects.

The depiction of three-dimensional models helps us to see the spatial features of the current and projected built environment. 3D modelling for interior design is generated by various tools, including AutoCAD, 3DMax, Sketchup, Blended, Archicad, and others that are widely used, both paid and free. Additional rendering applications, such as VRay, are required to create visual quality similar to reality. The rendering technique utilised for virtual reality demonstrates that combining virtual and real mixed-reality applications may improve the interactive efficiency and user experience of mixed-reality applications (Ping et al., 2021). Before rendering, 3D picture imagery must meet visual graphics quality standards such as light intensity, light source, light direction, contrast, shadow, and colour selection (Boughen, 2005).

Several previous studies have shown that modelling simulations using such software affect the perception and understanding of space and 3D models (Abdullah et al., 2022; Carmona-Medeiro et al., 2021; Kaleja & Kozlovská, 2017; Paes et al., 2017). 3D rendering—360º panoramic presentation is a progression of 3 Dimensions produced utilising panoramic techniques. Panoramic images provide us with a 360-degree view of the room's contents.

2.2 Hues, Saturation, Chromatic, and Achromatic Colours

Hue is the quality or attribute that distinguishes one hue from another. The second characteristic that distinguishes a colour is its saturation. It denotes the purity of a given colour, the property that differentiates it from a greyed-down hue. It is also known as strength, intensity, or chroma. The third dimension in the description of colour is lightness, or its synonymic value, which distinguishes dark hues from bright ones (Meerwein et al., 2007).

Further, Meerwein explains how to combine colours; it is often practical to use several different contrasts. The first is light-dark contrasts, most visible when combined with the achromatic colours black, white, and grey. Also, it can be made using combinations of chromatic colours and colours of the same hue yet with different degrees of lightness values. The lightness contrasts are ideal for generating spatial differences.

The second is chromatic-achromatic contrast, which results when chromatic and achromatic colours come together. Chromatic, pure, and highly saturated colours generate intense impressions and spontaneously stimulate attention when interacting with achromatic colours. The degree of prominence of chromatic-achromatic contrasts depends on the intensity of hue and brightness contrast. Chromatic-achromatic contrast is a principle widely used in interior design. In the visual arts, colour saturation is effectively controlled to balance opposing feelings and moods and to foster the illusion of relative distance within the pictorial plane.

Contrast polarity and its interplay with colour saturation influence the proportion of responses to contrast that are assimilated and have no impact. The findings show that colour saturation impacts figure-ground organisation directly by determining depth and indirectly by influencing background brightness through interaction with contrast polarity (Dresp-Langley & Reeves, 2014). The application of colour configurations directly related to high and low colour saturation to objects such as furniture and the background colour of walls, floors, and ceilings significantly impacts visual quality. Recent research on visual perception in virtual media demonstrates that lighting

and colour are the foundation for constructing renderings that represent virtual images (Díaz-Barrancas, Cwierz, Pardo, Pérez, & Suero, 2020; Krupinski, 2020; Lindemann & Ropinski, 2011).

Using continuous colour composition, grayscale, and a colour spectrum that considers colourblindness will improve an object's visual look (Díaz-Barrancas et al., 2020; Dresp-Langley & Reeves, 2014; Farné, 1977; Hedrich et al., 2009). Other studies have also shown that depth of field can be experienced through hue, colour brightness, and saturation changes. Egusa (1983) discovered that when achromatic colours were combined, the depth of field rose as the difference in brightness increased. However, no depth difference was felt when we combined achromatic-chromatic colours. Furthermore, in chromatic-chromatic pairings, the perceived depth of field is determined by the sequence of the red, green, and blue hues, with the perceived depth difference increasing as the saturation difference increases.

3.0 Methodology

This research uses descriptive research methods to test the model. Firstly, the test determines the visual acuity level and space depth. The model uses a rendered perspective from the Sketchup and Vray application in 3D rendering - 360º Panoramic and transferred into VR oculus. A space design should incorporate variable saturation colours as a background and object configurations. Secondly, in experiment 1, the floor, wall, and ceiling colours use achromatic, and the furniture use chromatic (see Fig. 1a). In experiment 2, the floor, wall, and ceiling colours use chromatic, and the furniture uses achromatic (see Fig. 2b).

The experiment used 20 male and female respondents with a background in visual arts education, aged between 18 and 40. The test was conducted through VR Oculus to see each respondent's response to the perspective images. Respondents were asked to complete a questionnaire with a semantic differential measurement scale of 1 to 7, modified from Flynn's experiment (Flynn et al., 1979). Finally, the measurement scale tested is related to the impression of visual and spatial understanding and depth of field. The test data will be analysed using descriptive statistical analysis (see Figure 1). Then, it will be categorised into a model showing that chromatic-achromatic and saturation colour composition affect visual three-dimensional space perceptions.

Fig. 1: (a) Achromatic (space-forming elements)-Chromatic (furniture); (b) Chromatic (space-forming elements)-Achromatic (furniture)
(Source: SketchUp's rendering 2023)

4.0 Findings

Perception is intimately tied to cognitive comprehension, stored in the human brain since acquiring information and knowledge. Similarly, visual perception of space is always connected to the things that make up space, which physically limits both. In our imaginations, physical space is a three-dimensional structure with space-forming elements seen in the shapes of floors, walls, and ceilings. Additionally, additional design elements such as lines, textures, patterns, colours, and light can enhance the visual experience of space. The test carried out in this study was connected to the rendering volume produced by 3D rendering 360º panoramic. Variables for colour composition and saturation are examined to determine the colour composition and saturation that bring clarity to objects, space, and depth of space.

The hypothesis expressed in this study is based on some of the outcomes of prior colour research and theories, namely, that chromatic and achromatic colour compositions significantly change visual clarity in objects, space, and depth of field. Colour saturation also affects the optical clarity of objects, space, and depth of field. The following data from 3D modelling rendering with Sketchup and Vray applications are grouped according to chromatic, achromatic, and colour saturation colour categories.

Table 1. 3D Rendering of AChromatic – Chromatic Colour Configuration

Colour Configuration	Space-forming elements	Saturation (%)	Reflection/ Specular (%)	Roughness (%)
	Floor Wall Ceiling	100 100 100	50 50 50	20 70 70

	Floor Wall Ceiling	50 75 100	50 50 50	20 70 70
	Floor Wall Ceiling	100 25 50	50 50 50	20 70 70
	Floor Wall Ceiling	75 100 25	50 50 50	20 70 70

(Source: Experiment's Data 2023)

Table 2. 3D Rendering of Chromatic – AChromatic Colour Configuration

Colour Configuration	Space-forming elements	Saturation (%)	Reflection/ Specular (%)	Roughness (%)
	Floor Wall Ceiling	100 100 100	50 50 50	20 70 70
	Floor Wall Ceiling	50 75 100	50 50 50	20 70 70
	Floor Wall Ceiling	100 25 50	50 50 50	20 70 70
	Floor Wall Ceiling	75 100 25	50 50 50	20 70 70

(Source: Experiment's Data 2023)

5.0 Discussion

5.1 The factors that influence subjective opinions

We aim to provide a comprehensive and evidence-based understanding of the elements influencing subjective opinions. We quantify the impacts of colour arrangement on the clarity of space and object and the depth of space on mean opinion ratings. According to Table 3 and Figure 2, respondents prefer an achromatic-chromatic (AC3) configuration with 100% floor colour saturation, 25% wall colour saturation, and 50% ceiling colour saturation to represent clarity of space and object and depth of space. The chromatic-achromatic (CA3) arrangement with 100% colour saturation on the floor, 25% on the walls, and 50% on the ceiling depicts hazy and flat sights of space.

Table 3. Measurement Colour Configuration

Colour Configuration	Clarity of space and object	Depth of space
AChromatic-Chromatic 1 (AC1)	1,6	2,5
AChromatic-Chromatic 2 (AC2)	1,9	2,2

AChromatic-Chromatic 3 (AC3)	1,6	1,7
AChromatic-Chromatic 4 (AC4)	2,7	1,9
Chromatic-AChromatic1 (CA1)	2,8	2,2
Chromatic-AChromatic 2 (CA2)	3,3	2,3
Chromatic-AChromatic 3 (CA3)	3,6	3,6
Chromatic-AChromatic 4 (CA4)	2,8	2,1

(Source) Statistical Analysis 2023)

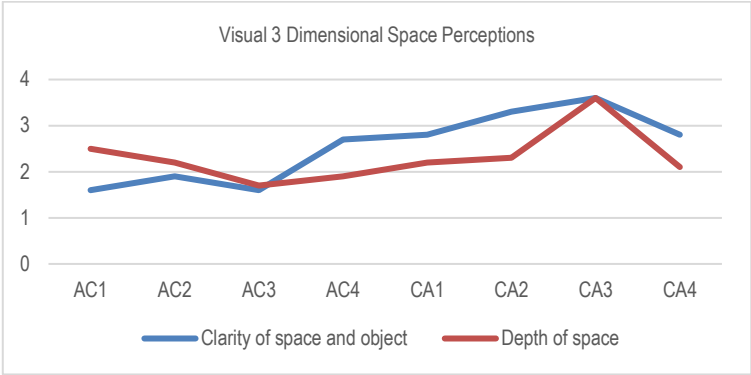


Fig. 2. Measurement Scale Diagram: Visual 3-Dimensional Spaces Perceptions
(Source: Statistical Analysis 2023)

Other studies have also proven that depth of field is constructed through hue, colour brightness, and saturation differences (Egusa, 1983). Depth of field can also be experienced through changes in hue, colour brightness, and saturation, according to this experiment. It was discovered that the depth of space in the combination of achromatic-chromatic colours is not dependent on the difference in brightness increases. In contrast, the clarity of space and object is experienced in various achromatic-chromatic colours. Furthermore, in chromatic-chromatic combinations, the perceived clarity of space and object and the perceived depth of space are affected by the hue combination, with the reported depth difference increasing as the saturation difference grows. The results also showed a correlation between colour saturation and achromatic-chromatic colour composition, thus providing a depth-of-field effect. Other research has found that colour saturation directly impacts the figure-ground organisation in grey by defining depth and indirectly influencing background brightness (Dresp-Langley & Reeves, 2014).

This paper explains the tests carried out to see if the colour composition of the achromatic and chromatic background and object affects visual clarity and depth on the display of 3-dimensional objects through visual reality, based on the theory and results of previous research. The analysis selection uses Anova with two dependent variables: visual clarity and depth of space. There are two independent variables, and the first is the colour configuration of achromatic-chromatic and chromatic-achromatic. Second is colour saturation with 25%, 50%, and 100% percentages. The results of the analysis can be concluded that differences in colour configuration significantly affect visual clarity (sig. 0.002) and have no significance on the depth of space (sig.0,106) (see Table 4). When the achromatic colours black, white, and grey are combined as a space element, the composition of light-dark contrasts affects visual clarity. When using chromatic colour combinations as a space element and colours of the same saturation, no spatial difference is generated because they have different degrees of lightness values.

Table 4. Anova Test of Between–Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	Clarity	40,387[a]	7	5,770	3,597	0,002
	Depth	23,088[b]	7	3,298	1,771	0,106
Intercept	Clarity	515,113	1	515,113	321.109	0,000
	Depth	427,812	1	427.812	229,698	0,000
Configuration	Clarity	40,388	7	5,770	3,597	0,002
	Depth	23,088	7	3,298	1,771	0,106
Error	Clarity	115,500	72	1,604		
	Depth	134,100	72	1,863		
Total	Clarity	671,000	80			
	Depth	585,000	80			
Corrected Total	Clarity	155,888	79			
	Depth	157,188	79			

a. R Squared = 0,259 (Adjusted R Square = 0,187)
b. R Squared = 0,147 (Adjusted R Square = 0,064)

(Source) Statistical Analysis 2023)

The results of the Table 5 analysis show that the configuration of AC3 as a combination impacts visual three-dimensional space perceptions. AC3 configuration with achromatic colours (white, grey, and black) for the furniture's floor, walls, and ceiling and chromatic colours (red, blue, and yellow). This conclusion corresponds to Egusa's statement (1983). An achromatic colour-black backdrop colour necessitates increased brightness to achieve the depth of field; in this test, the light was quite bright, and the brightness levels for all

stimulants were the same. Even though the colour saturation is the same, there is no sense of depth variation in the chromatic colour of the space element. The CA3 configuration demonstrates that chromatic colours (blue, green, and yellow) for the floor, walls, and ceiling, but achromatic colours (black, grey, and white) for the furniture do not affect the clarity and depth of space.

Table 5. Colour Configuration that Affects Clarity of Space and Object and Depth of Space

Configuration	Colour	Saturation		Colour	
AC3	AChromatic	Floor	100	Chromatic	Furniture
		Wall	25		Accessories
		Ceiling	50		
CA3	Chromatic	Floor	100	AChromatic	Furniture
		Wall	25		Accessories
		Ceiling	50		

(Source: Statistical Analysis 2023)

5.0 Conclusion

Our findings confirm that creating the correct colour configuration influences visual 3-dimensional space perception. A configuration that generates contrast between objects and space so that the depth of space is visible, as well as comparison to clarify space with objects in it. Designing a three-dimensional space that can be viewed using virtual Reality (VR) is critical. The discovery demonstrates that combining achromatic colours for space elements and chromatic colours for object colours provides greater depth of field perception than chromatic combinations. Suppose the colour combination is due to the lack of high contrast in the chromatic composition. In that case, the space will appear deep, combining colours with lightness/brightness that contrasts—combining chromatic colours results in chromatic contrast. It is most noticeable when combining three or more pure, highly saturated colours. The greater the number of similar colours, the more vivid and robust the contrast effect. Combinations located far apart on colour circles, such as yellow, red, and blue, produce the most significant possible difference and, thus, the most noticeable contrast. The chromatic contrast created by pure colours is striking, vibrant, and powerful, attracting attention.

The results for visual clarity with achromatic-chromatic and chromatic-achromatic combinations significantly influence the clarity of space and objects. As a result, the percentage of colour saturation in achromatic and chromatic colours with a composition of 100% for floors, 25% for walls, and 50% for ceilings can be concluded. This insight is priceless in digital media, particularly visual reality. Benefits for the development of colour configurations in virtual spaces: (1) need patrons of achromatic and chromatic colour configurations resulting from advanced research programs; (2) providing new predictions of colour configurations that affect visual perception; (3) naturally generalise in a broader context; and (4) encourage researchers to address the boundary conditions between art and aesthetics within virtual boundaries.

Acknowledgements

This research was carried out as part of a research funded by the ISI Yogyakarta Research Institute. We would also like to thank ISI Yogyakarta for financing this research.

Paper Contribution to Related Field of Study

This paper relates to the field of interior study, focusing on developing the final presentation project in a commercial interior design course and the student final project.

References

Abdullah, A. H., Wahab, R. A., Mokhtar, M., Atan, N. A., Halim, N. D. A., Surif, J.,Rahman, S. N. S. A. (2022). DOES Sketchup Make Improve Students' Visual-Spatial Skills? IEEE Access, 10, 13936–13953. https://doi.org/10.1109/ACCESS.2022.3147476

Bosselmann, P. (1999). Representation of Places: Reality and realism in city design. California: University of California Press.

Boughen, N. (2005). 3ds max Lighting. Texas: Wordware Publishing, Inc.

Carmona-Medeiro, E., Antequera-Barroso, J. A., & Domingo, J. M. C. noso. (2021). Future Teachers' Perception Of The Usefulness Of Sketchup For Understanding The Space And Geometry Domain. Heliyon, 7(10). https://doi.org/10.1016/j.heliyon.2021.e08206

Díaz-Barrancas, F., Cwierz, H., Pardo, P. J., Pérez, Á. L., & Suero, M. I. (2020). Spectral color management in virtual reality scenes. Sensors (Switzerland), 20(19), 116. https://doi.org/10.3390/s20195658

Dresp-Langley, B., & Reeves, A. (2014). Effects of saturation and contrast polarity on the figure-ground organization of color on grey. Frontiers in Psychology, 5(SEP). https://doi.org/10.3389/fpsyg.2014.01136

Egusa, H. (1983). Effects of brightness, hue, and saturation on perceived depth between adjacent regions in the visual field. Perception, 12(2), 167–175. https://doi.org/10.1068/p120167

Farné, M. (1977). Brightness as an indicator to distance: relative brightness per se or contrast with the background? Perception, Vol. 6, pp. 287–293. Retrieved from http://www.perceptionweb.com/perception/fulltext/p06/p060287.pdf

Flynn, J. E., Hendrick, C., Spencer, T., & Martyniuk, O. (1979). A Guide to Methodology Procedures for Measuring Subjective Impressions in Lighting. Journal of the Illuminating Engineering Society, 8(2), 96. https://doi.org/10.1080/00994480.1979.10748577

Hedrich, M., Bloj, M., & Ruppertsberg, A. I. (2009). Color constancy improves for real 3D objects. Journal of Vision, 9(4), 1–16. https://doi.org/10.1167/9.4.16

Kaleja, P., & Kozlovská, M. (2017). Virtual Reality as Innovative Approach to the Interior Designing. Selected Scientific Papers - Journal of Civil Engineering, 12(1), 109–116. https://doi.org/10.1515/sspjce-2017-0011

Krupinski, R. (2020). Virtual reality system and scientific visualisation for smart designing and evaluating of lighting. Energies, 13(20). https://doi.org/10.3390/en13205518

Lindemann, F., & Ropinski, T. (2011). About the influence of illumination models on image comprehension in direct volume rendering. IEEE Transactions on Visualization and Computer Graphics, 17(12), 1922–1931. https://doi.org/10.1109/TVCG.2011.161

MacEachren, A. M. (1995). How Maps Work: representation, visualisation and design. New York: The Guilford Press.

Meerwein, G., Rodeck, B., & Mahnke, F. H. (2007). Color - Communication in Architectural Space. In Color - Communication in Architectural Space. https://doi.org/10.1007/978-3-7643-8286-5

Paes, D., Arantes, E., & Irizarry, J. (2017). Immersive environment for improving the understanding of architectural 3D models: Comparing user spatial perception between immersive and traditional virtual reality systems. Automation in Construction, 84(September), 292–303. https://doi.org/10.1016/j.autcon.2017.09.016

Ping, J., Liu, Y., & Weng, D. (2021). Review of depth perception in virtual and real fusion environment. Journal of Image and Graphics, Volume 26, Pages 1503-1520. https://doi.org/10.11834/jig.210027

Shields, R. (2005). The Virtual. London: Taylor & Francis e-Library.

Whyte, J. (2002). Virtual Reality and The Built Environment. Oxford: Architectural Press.

Zhang, L. (2019). Virtual Design Method of Interior Landscape Based on 3D Vision. Open House International, 44(3), 36–39. https://doi.org/10.1108/ohi-03-2019-b0010

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

From Paper to Screen: Transitioning conventional posters to digital posters for environmental sustainability

Petrus Gogor Bangsa

Visual Communication Design,
Institut Seni Indonesia Yogyakarta, Yogyakarta, Indonesia

gogorbangsa@isi.ac.id
Tel: +628112508687

Abstract

The transition from print to digital media holds significant potential for reducing environmental impact. Traditional print media requires substantial natural resources and generates significant waste and greenhouse gas emissions. Digital media offers environmental benefits by eliminating the need for paper, ink, and physical printing processes, increasing energy efficiency, and reducing physical waste. Digital visual communication design can deliver dynamic and interactive messages, enhancing engagement and reaching a global audience quickly and cost-effectively. For a successful transition, designers must address challenges such as dependency on digital technology and data privacy issues.

Keywords: Digital media; environmental sustainability; visual communication design; digital posters

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6175

1.0 Introduction

Environmental sustainability is one of the most pressing issues in today global context. With climate change, ecosystem degradation, and rising pollution becoming increasingly accurate, finding sustainable solutions is becoming more urgent. Environmental sustainability includes efforts to maintain ecological balance, reduce the negative impact of human activities on nature, and ensure that future generations can enjoy natural resources (Baldassarre et.al, 2024; Bodo et.al, 2021).

Visual communication design plays a vital role in supporting environmental sustainability. Visual communication media can convey messages about the importance of ecological preservation effectively and widely. The use of technology and digital media in visual communication design, such as digital posters, opens up significant opportunities to reduce non-renewable resources like paper and ink while increasing the efficiency and reach of information. Visual communication design can also positively influence public behaviour, encouraging people to be more environmentally conscious (Ji & Lin, 2022).

Victor Papanek (2006) stated,"...design has become the most powerful tool used by humans to shape tools and environments (and, by extension, society and themselves)".

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6175

Papanek, a pioneer in sustainable design, emphasised that designers have social and ecological responsibilities. Designers always act as agents of change in society (de Mozota, 2010). Papanek believes good design must be aesthetic, ethical, and environmentally friendly. His principles are relevant in transitioning media from conventional to digital, where innovation in visual communication design can significantly contribute to environmental sustainability.

This paper explores how the transition from paper to screen in visual communication media can support environmental sustainability, referring to Papanek's principles on sustainable design. This analysis will show how this change helps reduce environmental impact and enhances message delivery effectiveness in the increasingly digital era. Wisely applied visual communication design can be a powerful tool to educate and inspire the public about the importance of environmental sustainability, aligning with Papanek's responsible design vision (Rosario & Dias, 2022; Scarzella, 2020).

For example, conventional print media has a significant environmental impact because producing paper, ink, and printing requires substantial natural resources and generates waste and harmful emissions. Paper production often causes deforestation and high water consumption, disrupting local ecosystems. The printing process uses oil-based inks that are harmful to the environment, and print media generates a lot of paper waste that is difficult to recycle efficiently. Moreover, print media production and distribution processes produce significant carbon emissions, worsening environmental problems. Thus, transitioning to digital media can address these environmental issues, such as digital posters that can be distributed online via digital devices quickly, practically, cheaply, and environmentally friendly (FESPA, 2021; Cumming, 2021).

This paper explores how the transition from conventional print media to digital media can support environmental sustainability, particularly from the perspective of visual communication design. Referring to Victor Papanek's socially and ecologically responsible design thoughts, this paper will analyse how innovations in visual communication design can reduce the environmental impact caused by print media. This approach aims to reduce the use of natural resources and waste and improve the effectiveness of message delivery in the increasingly digital era.

This paper will demonstrate how the transition to digital media supports environmental sustainability goals and enhances the quality and reach of information delivered to the public by connecting Papanek's sustainable design principles with visual communication design practices.

2.0 Literature Review

2.1 Visual Communication Design: Definition and Role

Visual Communication Design is a field that combines visual elements such as images, typography, and colours to convey messages or information effectively through a medium. This design bridges information and the audience, making messages more easily understood and attractive. Visual communication design encompasses various media, including print, digital, and interactive media, each with its characteristics and specific techniques (Meggs, 2012).

The primary role of visual communication design is to facilitate clear and effective communication. Visual communication designers apply design principles such as balance, contrast, harmony, and hierarchy to create aesthetic and functional works. Some important roles of visual communication design for the audience include enhancing audience understanding, attracting audience attention, building brand identity, evoking audience emotions and actions, and increasing accessibility (Weber, 2024).

In environmental sustainability, visual communication design is crucial in conveying messages about environmental preservation and the importance of sustainable practices. By shifting from conventional print to digital media, visual communication design can reduce environmental impact while effectively conveying information. Visual communication designers are responsible for creating aesthetic, ethical, and environmentally friendly works in line with Victor Papanek's sustainable design principles (Silpa & Harilal, 2024).

2.2 Victor Papanek: Socially and Ecologically Responsible Design

Victor Papanek is one of the most influential thinkers in sustainable and socially responsible design. In his work *"Design for the Real World: Human Ecology and Social Change",* Papanek articulated several principles emphasising the importance of design that is not only aesthetic but also ethical and environmentally friendly (Wilson & Bhamra, 2020).

Papanek believed that design should holistically serve human needs, not just aesthetic or commercial ones. He emphasised that designers are responsible for creating solutions that solve real problems and improve the quality of human life. Design must be inclusive and consider various societal groups, including those who are underserved or have special needs (de Mozota, 2010).

One of Papanek's main principles is that design must consider environmental impact. He strongly criticised design practices that waste resources and pollute the environment. Papanek encouraged using recyclable materials, renewable energy, and environmentally friendly production processes. Design should consider the entire lifecycle of a product, from production to disposal, to minimise its ecological footprint (Pacey, 2000).

Papanek emphasised that designers must be socially responsible. It means that design must consider the social implications of the products and services created. Designers must consider how their products affect society, culture, and the economy. Socially responsible design also includes ethical principles in business and production practices (Fallan, 2021).

According to Papanek, good design is efficient and minimalist. He argued that design should use resources efficiently, avoid waste, and focus on the primary function of the product. Minimalism in design means creating simple, intuitive, and easy-to-use solutions without unnecessary elements (Ceschin & Gaziulusoy, 2020)

Papanek encouraged designers to innovate with social good as the goal. Innovation in design should focus on creating solutions that solve social and environmental problems. He invited designers to think creatively and find new ways to tackle global challenges such as poverty, health, education, and climate change.

Papanek also highlighted the importance of learning from nature in creating sustainable designs. He believed that observing and mimicking natural processes and structures (biomimicry) would lead to many innovative design solutions. Nature-inspired design tends to be more efficient and sustainable because evolution has optimised it (Illieva, et.al, 2022; Jiang, et.al, 2024; Othmani, et.al, 2022).

Through these principles, Victor Papanek urged designers to be more responsible in their practices, creating works that are not only beautiful but also beneficial for society and the environment. His ideas have become a cornerstone of the sustainable design movement and inspire designers worldwide to create more ethical and environmentally friendly solutions.

3.0 Methodology

This research uses descriptive research methods to test the media transition model. A literature review on visual communication design, environmental sustainability, and the transition from print to digital media provides this research with the needed data. Literature sources include books, journal articles, and online sources encompass Victor Papanek's work and sustainable design principles. Subsequently, a qualitative analysis identifies the main themes and relationships between visual communication design, digital media, and environmental sustainability.

The data from literature analysis and observations are then synthesised and critiqued to develop arguments regarding the benefits of transitioning to digital media in supporting environmental sustainability. This process involves testing the findings against Victor Papanek's sustainable design principles and critically analysing their practical implementation. The analysis results are summarised in conclusions that show how the transition from print to digital media can support environmental sustainability. This study also proposes practical recommendations for visual communication designers and the media industry to apply the sustainable design principles in maximizing the environmental benets of digital media.

4.0 Findings

The transition from conventional print media to digital media has significant potential to reduce environmental impact. Paper production requires substantial natural resources, such as wood, water, and energy, which often result in deforestation and generate significant waste and greenhouse gas emissions. Oil-based inks used in printing also contain harmful chemicals, while paper waste that is difficult to recycle often ends up in landfills, adding to the solid waste burden.

The shift to digital media offers significant environmental benefits. Digital media does not require paper, ink, or physical printing processes, thus reducing the use of natural resources. Digitisation allows for the wide distribution of information without printing physical copies and offers higher energy efficiency than print media. Digital media also produces less physical waste, and digital devices can be recycled and updated, reducing electronic waste.

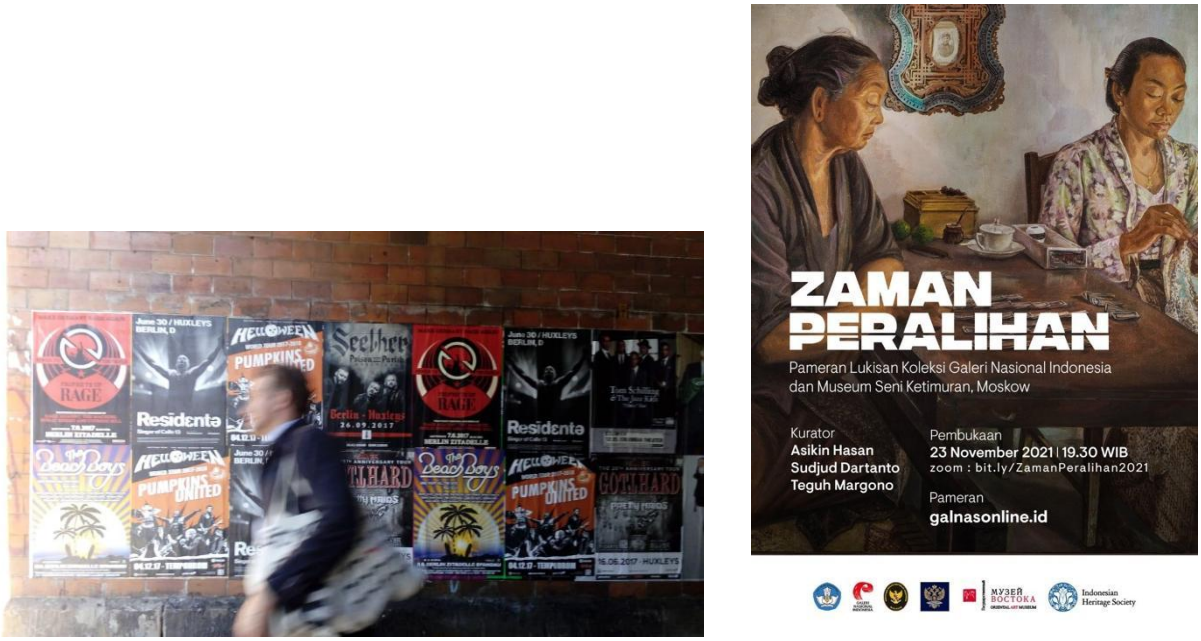


Fig. 1: Conventional posters (left); digital poster (right)
(Source:) Gogor Bangsa (left); Galeri Nasional (right)

Visual communication design in digital media has several advantages in supporting environmental sustainability. Digital media allows for more dynamic and interactive message delivery, enhancing audience engagement and communication effectiveness. The reach of information is also broader, allowing environmental sustainability campaigns to quickly and cost-effectively reach a global audience. Digital technology enables innovation in more environmentally friendly design, such as using more efficient vector-based graphics.

A real-world example of using digital posters is for publication and information purposes, such as event announcements and invitations. Digital posters can be distributed via social media, email, and websites, spreading information faster and broader without printing costs. Additionally, digital posters can be updated in real time if there is a change in information, ensuring that the audience always receives the latest information. Using digital posters in environmental campaigns, seminars, concerts, and community events has effectively increased public participation and awareness without adding to the environmental burden. The public have also been familiar with various social media for communication and accessing information, such as WhatsApp, Instagram, and Facebook. These social media platforms are the most frequently accessed by the Indonesian public.

However, the transition to digital media also faces several challenges. Dependence on digital devices and technology infrastructure can be a barrier, especially in areas with limited technology access. Data security and privacy are also important issues, and people must address the digital divide to ensure that everyone has equal access to technology. Enhancing digital literacy and technology access across various community groups must be continuously promoted.

5.0 Discussion

The transition from conventional print media to digital media in visual communication design shows excellent potential for supporting environmental sustainability. This research indicates that print media has a significant environmental impact due to its extensive use of natural resources and harmful waste production. By shifting to digital media, many of these negative impacts can be minimised or even eliminated.

For instance, the use of digital posters offers several significant advantages over printed posters. Not only do digital posters reduce paper and ink consumption, but they also allow for the broader and faster distribution of information. Information can be disseminated effectively without geographical limitations and additional production costs by leveraging digital platforms such as social media, email, and websites. Additionally, digital posters can be updated in real-time, ensuring the information conveyed is always accurate and up-to-date.

However, although digital media offers many environmental benefits, this transition also faces several challenges. Dependence on digital technology means that access to devices and the internet becomes crucial. However, limited access in some areas creates a digital divide that we should address to ensure that everyone can get the benefits from digital media. Moreover, while digital devices can be recycled, still their production and disposal have environmental impacts that we must appropriately manage.

Visual communication design in digital media also brings new data security and privacy challenges. Protecting personal data and sensitive information in the digital era is increasingly essential. Designers and users must ensure that the platforms used are secure and that collected data is not misused.

In environmental sustainability, visual communication design is vital in conveying important messages about environmental conservation. Digital technology enables designers to create aesthetic, ethical, and environmentally friendly works. Victor Papanek's sustainable design principles are highly relevant in this context. Papanek emphasised that designers have a social and ecological responsibility to create solutions that solve real problems and improve the quality of human life (de Bont, 2021).

Connecting these principles with visual communication design practices, it is evident that the transition to digital media supports environmental sustainability goals and enhances the quality and reach of information delivered to the public. Designers must continue to innovate with social and environmental good as the goal, creating inclusive, efficient, and minimalist works.

Ultimately, the success of the transition from print media to digital media in supporting environmental sustainability depends dramatically on our ability to overcome these challenges. Efforts to improve technology access, data security, and digital literacy must continue. With a wise and innovative approach, visual communication design in digital media can become a powerful tool to educate and inspire the public about the importance of environmental sustainability.

Although the transition to digital media offers many benefits, several limitations and challenges are faced. One of the main challenges is the need for significant investment in digital technology and infrastructure. Media companies must allocate substantial resources to develop effective digital platforms and train employees to master new technologies. Additionally, there are challenges in monetising digital content. Traditional business models relying on print advertising revenue must adapt to digital models that depend on online advertising, subscriptions, and digital content monetisation. It requires more complex marketing strategies and the ability to analyse user data to optimise revenue. The article *Design for the Sustainable World* by the World Design Organization also highlights the challenge of ensuring that the transition to digital media does not compromise content quality and audience engagement. They note that designers must create content that remains relevant and appealing to the audience while adhering to sustainability principles (WDO, 2020). Furthermore, there are challenges related to digital accessibility. Not all individuals have the same access to digital technology and the internet, which can create information gaps. Visual communication designers must consider inclusivity in their designs to ensure that information is accessible to everyone, including those with physical limitations or limited access to technology. While the transition to digital media presents challenges, it also offers excellent opportunities to create more sustainable and innovative solutions. By adopting Victor Papanek's sustainable design principles, the media industry can contribute to global sustainability goals while remaining relevant and competitive in the digital era.

6.0 Conclusion and Recommendations

6.1 Conclusion

The transition from conventional print media to digital media holds significant potential for reducing environmental impact. Traditional print media requires substantial natural resources such as wood, water, and energy, leading to deforestation and generating significant waste and greenhouse gas emissions. The use of oil-based inks in printing contains harmful chemicals, while paper waste, often challenging to recycle, ends up in landfills, adding to the solid waste burden.

Digital media offers considerable environmental benefits by eliminating the need for paper, ink, and physical printing and conserving natural resources. Digitisation allows for the wide distribution of information without printing physical copies and offers higher energy efficiency than print media. Digital media also produces less physical waste, and digital devices can be recycled and updated, reducing electronic waste.

Visual communication design in digital media enhances environmental sustainability by delivering dynamic and interactive messages that increase audience engagement and communication effectiveness. Digital platforms enable broader information reach, allowing environmental sustainability campaigns to quickly and cost-effectively reach a global audience. Digital design innovations like vector-based graphics offer more efficient and sustainable solutions.

Despite the benefits, the transition to digital media faces challenges such as dependency on digital devices and technology infrastructure, particularly in areas with limited access. Data security and privacy issues also arise, and addresing the digital divide is the key to ensure equitable access to technology. The designers must put efforts to enhance digital literacy and technology access across various community groups.

6.1.1 Limitations

Although the shift to digital media offers many environmental benefits, this research has several limitations that should be noted. First, energy consumption for digital infrastructure, such as data centers and servers, requires a significant amount of energy. Depending on the energy source, this can still contribute to environmental degradation, especially when relying on non-renewable energy sources. In addition, the rapid advancement of digital devices leads to an increase in electronic waste (e-waste). The management and recycling of digital devices are still not optimal, posing significant environmental and health risks. The digital divide also remains a challenge, as the benefits of digital media are not yet equally accessible to everyone. Many regions, especially in rural or economically disadvantaged areas, still face limited access to the internet and digital literacy, which hinders their participation in digital advancements. Furthermore, the increasing use of digital platforms also raises concerns about data privacy and security. Mismanagement of personal data and cyber security threats can undermine trust and hinder the widespread adoption of digital media. Dependence on technology is another concern, as a heavy reliance on digital infrastructure can create vulnerabilities, particularly in regions where technological infrastructure is fragile or frequently disrupted.

6.2 Recommendations

Governments and organisations should invest in improving access to digital technology and internet connectivity, particularly in underserved areas. This step is crucial to bridge the digital divide and ensure equitable access to the benefits of digital media. Additionally, designers and media platforms should prioritise data security and privacy, ensuring user data is protected and not misused. Implementing strong security measures and educating users about data privacy is essential.

Designers should also adopt the sustainable design principles advocated by Victor Papanek. The primary focus should be creating efficient, minimalist, and environmentally friendly solutions. Using recyclable materials, renewable energy, and sustainable production processes should become standard practice in design. Moreover, leveraging the advantages of digital media, such as real-time updates and interactivity, can enhance the effectiveness and engagement of communication. Designers should create interactive and easy-to-update digital posters and other media to guarantee the audiences well-informed and engaged.

Developing inclusive digital content is also very important. Digital content must be accessible to everyone, including individuals with physical limitations or limited access to technology. Inclusive design practices should be adopted to ensure that information is accessible to everyone. Continuous innovation in digital design should be encouraged to create more sustainable and impactful communication tools. Designers should explore new technologies and creative solutions to address global environmental challenges.

Addressing these recommendations can effectively support environmental sustainability from print to digital media. This step will enhance the quality and reach of information while promoting responsible and ethical design practices.

Paper Contribution to Related Field of Study

This paper relates to visual communication design by demonstrating how the transition from conventional to digital posters can significantly reduce environmental impact while enhancing the effectiveness of visual communication through sustainable design practices.

References

Baldassarre, B., Calabretta, G., Karpen, I. O., Bocken, N., & Hultink, E. J. (2024). Responsible design thinking for sustainable development: Critical literature review, new conceptual framework, and research agenda. *Journal of Business Ethics*. https://doi.org/10.1007/s10551-023-05600-z

Bodo, T.; Gimah, B.G.; & Seomoni, K.J.; (2021). Deforestation and Habitat Loss: Human Causes, Consequences and Possible Solutions. *Journal of Geographical Research*. Volume 04 Issue 02 April 2021 DOI: https://doi.org/10.30564/jgr.v4i2.3059

Ceschin, F.; & Gaziulusoy, I. (2020). *Design for Sustainability A Multi- level Framework from Products to Socio- technical Systems*. London: Routledge.

de Bont, C., (2021). Furthering Victor Papanek's legacy: A personal perspective. *She Ji The Journal of Design Economics and Innovation*, 7(2):262–281. DOI: 10.1016/j.sheji.2020.08.010

de Mozota, B. B. (2010). Design management as core of competency: From "design you can see" to "design you can't see". *The Journal of Design Strategies*, 4(1), 91-98.

Fallan, K. (2021). Victor Papanek: Designer for the Real World. *Journal of Design History*, Volume 34, Issue 4, December 2021, pp. 378–379, https://doi.org/10.1093/jdh/epab040

FESPA. (2021). The Long Road to a More Sustainable Printing Industry. https://www.fespa.com/en/news-media/the-long-road-to-a-more-sustainable-printing-industry (Retrieved October 18, 2024)

Illieva, L; Ursano, I.; Traista, L.; Hoffman, B., & Dahy, H. (2022). Biomimicry as a Sustainable Design Methodology—Introducing the 'Biomimicry for Sustainability' Framework. *Biomimetics* 2022, *7*(2), 37; https://doi.org/10.3390/biomimetics7020037

Jiang, S.; Deng, W.; & Lin, H. (2024). Sustainability through Biomimicry: A Comprehensive Review of Bionic Design Applications. *Biomimetics* 2024, *9*(9), 507; https://doi.org/10.3390/biomimetics9090507

Ji, S.; & Lin, P.S. (2022). Aesthetics of Sustainability: Research on the Design Strategies for Emotionally Durable Visual Communication Design. *Sustainability* 2022, 14, 4649. https://doi.org/10.3390/su14084649

Meggs, Philip B.; & Purvis, Alston W. 2012. *Meggs' History of Graphic Design*. New Jersey: John Wiley & Sons.

Othmani, N.I.; Mohamed, S.A.; Hamid, N.H.A.; & Ramlee, N. (2022). Reviewing biomimicry design case studies as a solution to sustainable design, August 2022 *Environmental Science and Pollution Research* 29(2) DOI:10.1007/s11356-022-22342-z

Pacey, A., (2000). *The Culture of Technology*. Cambridge: The MIT Press.

Papanek, V. (2006). *Design for the real world: Human ecology and social change*. London: Thames & Hudson.

Rosario, A.T; & Dias, J.C. (2022). Sustainability and the Digital Transition: A Literature Review. *Sustainability* 2022, *14*(7), 4072; https://doi.org/10.3390/su14074072

Scarzella, P. (2020). *Victor Papanek, the pioneer of social and sustainable design for the real world*. https://www.lifegate.com/victor-papanek-design-real-world (Retrieved October 18, 2024)

Silpa, V; Harilal, H. (2024). Graphic Design and Environtmental Sustainability. *European Journal of Ecology, Biology and Agriculture* (ISSN 3041-1580) Volume 1 Number 3 2024

Thomas, J., & Strickfaden, M. (2022). Design for the real world: A look back at Papanek from the 21st century. *AHFE Open Access Journal.* https://doi.org/10.54941/ahfe1002010

Weber, W. (2024). Editorial: Insights in visual communication: 2022. *Frontier in Communication*. 9:1426182. doi: 10.3389/fcomm.2024.1426182

Wilson, G.T.; & Bhamra, T. (2020). Design for Sustainability: The Need for a New Agenda. *Sustainability* 2020, 12, 3615; doi:10.3390/su12093615.

World Design Organization. (2020). *Design for the sustainable world*. Retrieved from https://wdo.org/design-for-the-sustainable-world/

Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

ARCADESA2024Yogyakarta

https://arcadesa.isi.ac.id/index.html

8th Art, Craft and Design in Southeast Asia International Symposium

ISI Yogyakarta Indonesia, 27-28 September 2024

Organised by: Institute Seni Indonesia, Yogjakarta, Indonesia

e-IPH e-International Publishing House Ltd., United Kingdom

Future of Waste Bin Design in the Age of Automation in Indonesia

Baridah Mutmainah[1]* Flavia Alice Mameli[2]

**Corresponding Author*

[1] Industrial Design Program, Institut Seni Indonesia Yogyakarta, DI Yogyakarta, Indonesia
[2] Post Doctoral Program, University of the Arts Bremen, Germany

baridah@isi.ac.id, flavia.mameli@googlemail.com
Tel: +6287824213445

Abstract

Due to ongoing waste management issues, the Indonesian government is promoting Industry 4.0 technologies to enhance productivity and efficiency, focusing on waste bin design. This research investigates whether Indonesia is ready for automation technology in waste bin and waste management systems or if it remains a distant goal. The study identifies key elements and challenges through a comprehensive literature review and systematic screening, including infrastructure limitations, technological readiness, and socio-economic factors. The findings provide insights and guidelines for future efforts toward achieving efficient, sustainable waste management solutions through automation in Indonesia.

Keywords: Automation; waste bin; Indonesia

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6180

1.0 Introduction

The future of waste bin design in Indonesia is advancing towards automation and integrating Internet of Things (IoT) systems, aiming to improve waste management efficiency, cut costs, and enhance sustainability. Smart trash bins are a crucial development in this area. These bins have sensors and IoT connectivity, allowing them to monitor waste levels and weights in real time, facilitating efficient waste collection and management. This technology is essential in reducing the cost of waste separation and enhancing the overall efficiency of waste management in smart cities (Huh et al., 2021; Manik et al., 2024).

Another significant innovation is the development of automatic trash cans, such as those based on Arduino Uno. These cans are designed to detect and segregate various types of waste, contributing to sustainable development goals. They can manage different amounts of waste and use actuators to open containers based on sensor data. Moreover, they often include additional features like integrated hand sanitizer dispensers to promote hygiene (Aqilah et al., 2021).

Automating waste management has implications for employment, potentially displacing specific jobs while creating new opportunities. The rise of the gig economy and online commerce in Indonesia is expected to generate new job opportunities. Implementing automation technologies can result in a net gain in employment, especially in emerging and evolving sectors (Agarwal, 2019).

eISSN: 2398-4287 © 2024. The Authors. Published for AMER and cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), and cE-Bs (Centre for Environment-Behaviour Studies), College of Built Environment, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v9iSI23.6180

The Indonesian government is actively working towards transforming the country into an Industry 4.0 economy, which encompasses the adoption of advanced technologies such as automation and IoT. This initiative aims to boost productivity, foster GDP growth, and create jobs while addressing the challenges posed by job displacement (Agarwal, 2019).

The future of waste bin design in Indonesia is closely tied to integrating automation and IoT technologies, which still need to be built. The key challenges are community engagement, education, government support, and policy (Fei et al., 2024; Saffa, 2024). Only now does Indonesia have a littering policy, but it is never really implied in everyday life because of the low execution rate by the local government. Even though this technology integration promises to improve waste management efficiency, support sustainability efforts, and generate new job opportunities while navigating the complexities of economic and employment transformation, Indonesia will need to work hard to make it a dream come true.

This study aims to assess Indonesia's readiness for adopting automation in waste management, focusing on smart bin designs. It identifies key challenges—technological, infrastructural, and socio-economic—and offers recommendations to fast-track sustainable, automated solutions. The research provides insights into how automation can improve efficiency and sustainability while addressing socio-political and economic barriers.

2.0 Literature Review

2.1 Industry 4.0 Technologies in Waste Management

Integrating Industry 4.0 technologies, particularly automation, and IoT, is transforming waste management globally. Smart waste bins are crucial to this transformation, leveraging advanced technologies to enhance waste management efficiency, reduce environmental pollution, and promote sustainable urban development.

Smart waste bins use various technologies such as sensors, microcontrollers, and IoT connectivity to monitor waste levels, detect the type of waste, and facilitate real-time data transmission. These bins can perform functions like waste sorting, remote control, voice recognition, capacity monitoring, wet and dry separation, and sensor-activated lids, making them highly efficient and practical (Fei et al., 2024).

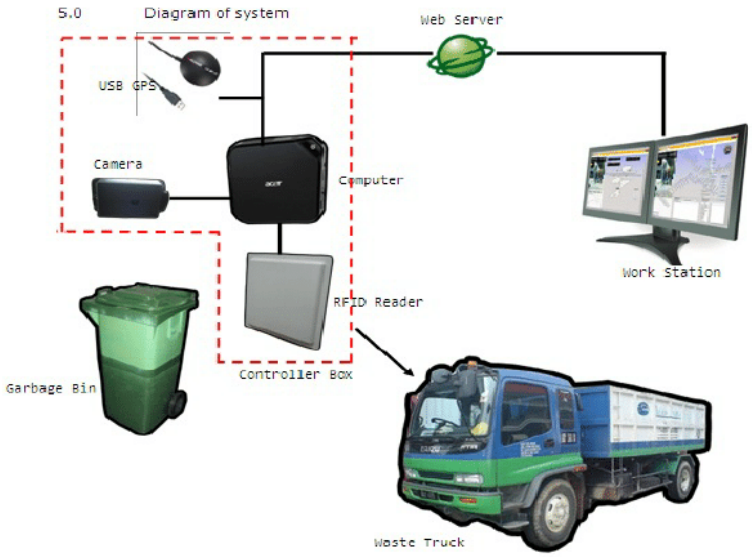


Fig. 1: Illustration of waste bin monitoring using IoT (Internet of Things)
(Source: https://www.researchgate.net/figure/System-Architecture-of-Waste-Bin-Monitoring_fig4_233398879)

2.2 Case Studies from Other Countries

Singapore has successfully integrated smart waste bins with its existing waste management system. This integration ensures that data from the smart bins is seamlessly transmitted to the central management system, enhancing the efficiency and effectiveness of waste collection and management (Fei et al., 2024).

Similarly, South Korea has implemented smart waste bins that utilize IoT technology to monitor waste levels in real-time. This data is then analyzed to optimize waste collection routes and reduce the frequency of emptying bins, thereby improving efficiency and reducing costs. In the United States, smart waste bins equipped with sensors monitor waste levels and detect the type of waste. This system helps reduce the cost of trash separation work and improve overall waste management efficiency (Fei et al., 2024).

Fig. 2: An example of using IoT (Internet of Things) in waste management in South Korea is installing wirelessly connected fill-level sensors in their waste containers. *(Source: https://www.ecubelabs.com/iot-waste-management-detect-a-full-trash-can-remotely/)*

Fig. 3: BigBelly Waste bin in Singapore will send alerts for them to be cleared when they are almost complete.
(Source: https://www.straitstimes.com/singapore/solar-powered-smart-bins-that-act-as-wi-fi-hotspots-launched-at-orchard-road)

2.3 Current State of Waste Management in Indonesia

Indonesia faces significant challenges in waste management due to rapid urbanization and increased waste generation. The current practices often involve manual sorting and collection, which could be more efficient and prone to errors. Organic waste is the most common type of garbage in Yogyakarta, accounting for 50.21% of total waste (Fei et al., 2024).

The Indonesian government has implemented various policies and initiatives to address these challenges and improve waste management. These include mandatory household waste sorting and efforts to promote sustainable urban development. However, the coverage of smart waste management technologies remains limited, and the degree of automation could be higher, with manual sorting still dominating the waste management practices (Okubanjo et al., 2024).

Fig. 4: Bina Bangsa Elementary School (Jakarta, Indonesia) Projects are being done to prototype an smart waste bin using both.
(Source: https://zone.binabangsaschool.com/projectfair/portfolio/automated-trash-bin-with-uv-disinfection-prototype/*)*

2.4 Challenges and Barriers

Indonesia faces significant challenges ensuring reliable network connectivity, particularly in rural areas. Implementing smart waste bins will require robust and widespread network infrastructure to support real-time data transmission and monitoring (Fei et al., 2024). While Indonesia is actively exploring and implementing automation and IoT technologies in waste management, areas still need further exploration. Real-time monitoring, cost-effectiveness, and user interaction experience require further refinement and innovation (Wijaya et al., 2017).

Educating the community about the benefits and proper use of smart waste bins is crucial for their acceptance and successful implementation. Leveraging existing community engagement programs and educational initiatives can promote the adoption of smart

waste bins (Wijaya et al., 2017). Indonesia is making significant strides toward adopting automation technology in waste bins and management systems. However, the country still faces infrastructure, technological readiness, and socio-economic challenges. By addressing these challenges and leveraging successful case studies from other countries, Indonesia can effectively integrate smart waste bins into its waste management systems, improving efficiency, reducing costs, and promoting sustainable waste management practices.

3.0 Methodology

The research design includes a comprehensive literature review to gather and analyze existing studies, articles, and reports on waste bin design, automation, and waste management in Indonesia and other countries. This approach allows for an in-depth understanding of the current state of waste management, the challenges faced, and the potential solutions. The literature review method is justified because it provides a broad and in-depth understanding of the topic, enabling researchers to identify gaps in knowledge and areas needing further investigation. Academic articles, government reports, and case studies were analyzed. Data focused on smart waste bin design, implementation, impact, and efficiency. Exclusion criteria included non-peer-reviewed or theoretical studies.

The data analysis methods include content analysis and spatial analysis. Content analysis involves systematically analyzing the content of the literature to identify themes related to smart waste bin design, automation, and waste management. Spatial analysis is used to analyze the spatial distribution of waste bins and the impact of smart waste bins on waste management efficiency in urban environments (Prastyabudia & Permatab, 2021)

4.0 Findings

4.1 Implementing smart waste bins in Indonesia

Implementing smart waste bins in Indonesia involves several costs, including initial investment, maintenance, and operational expenses. These costs are critical to consider for successful implementation and long-term sustainability. The initial investment encompasses the cost of purchasing and installing smart waste bins, which include sensors, microcontrollers, and network infrastructure. This also covers the expenses for load cells, RFID tags, and other components necessary for real-time monitoring and data collection (Wijaya et al., 2017). Additionally, network connectivity costs are another significant factor, as IoT devices such as LoRa gateways and sensors are essential for transmitting data from the waste bins to the central management system, adding to the initial investment (Azahra et al., 2023; Hanafi et al., 2024).

Training citizens and waste management personnel on smart waste bin usage and maintenance is crucial but costly (Febria et al., 2023). Government support and policy development are essential but require significant investment (Wijaya et al., 2017). Ongoing operational costs, such as energy consumption, add to the overall expenditure.

4.2 Implementing smart waste bins in Indonesia faces several interconnected challenges that must be addressed for successful and sustainable integration.

A major hurdle is ensuring reliable and widespread network connectivity, particularly in rural and remote areas. This connectivity is crucial for effective data transmission and real-time monitoring of waste bins, laying the foundation for the system's functionality and efficiency (Manik et al., 2024). However, the cost and financial sustainability of these systems present significant barriers. The initial investment in smart waste bin infrastructure and ongoing maintenance expenses can be substantial, potentially deterring local governments and communities from adopting the technology (Mousavi et al., 2023).

Adoption and user acceptance are critical to the system's success. Changing citizens' habits to use smart waste bins and ensuring their acceptance of new technologies can be challenging, especially in regions where traditional waste management practices are deeply rooted (Mohammed et al., 2022). This challenge is compounded by the complexity of integrating smart waste bins with existing waste management systems. Significant modifications to the current infrastructure may be required to ensure seamless data exchange and effective operation, adding another layer of complexity to the implementation process (Wijaya et al., 2017).

Data security and privacy also emerge as crucial concerns. Protecting data collected from smart waste bins, susceptible information such as waste composition, and resident data is essential to maintaining public trust and compliance with regulations (Hanafi et al., 2024). Furthermore, the maintenance and repair of smart waste bins, including sensor calibration and replacing faulty components, can be particularly challenging in areas with limited maintenance resources and technical expertise (Mohammed et al., 2022).

Encouraging behavioral change among citizens to segregate waste properly and use smart waste bins correctly requires continuous education and motivation. This slow and demanding process is vital for the long-term success of smart waste management systems. Securing government support and policy backing is equally crucial. Government involvement can provide the necessary funding, regulatory framework, and incentives to promote these systems' adoption and integration (Mohammed et al., 2022).

5.0 Discussion

5.1 Lessons Learned from Successful Cases

Comparing the future of waste bin design in the age of automation in Indonesia with successful cases from other countries can provide valuable lessons and insights for its implementation in Indonesia. Lessons learned from successful cases highlight several vital aspects.

First, the integration with existing systems is crucial. Singapore has successfully integrated smart waste bins with its existing waste management system. This integration ensures that data from the smart bins is seamlessly transmitted to the central management system, enhancing the efficiency and effectiveness of waste collection and management (Okubanjo et al., 2024). Real-time monitoring and data analysis are also essential components. South Korea has implemented smart waste bins that use IoT technology to monitor waste levels in real time. This data is then analyzed to optimize waste collection routes and reduce the frequency of emptying waste bins, thereby improving efficiency and reducing costs (Huh et al., 2021).

Sustainability and cost-effectiveness are vital considerations as well. The United States has implemented smart waste bins that use sensors to monitor waste levels and detect the type of waste. This system helps reduce the cost of trash separation work and improve overall waste management efficiency. Such systems can be adapted to the Indonesian context to achieve similar benefits. Moreover, community engagement and education play a significant role. New York City (NYC) has successfully implemented smart waste bins that include features like sensors and RFID tags. These bins are designed to engage the community and educate residents about proper waste disposal practices. Similar initiatives can be implemented in Indonesia to promote sustainable waste management practices and community involvement (Huh et al., 2021). By learning from these successful cases, Indonesia can effectively navigate the challenges and leverage the opportunities that automated waste bin design presents.

5.2 Applicability to the Indonesian Context

The applicability of smart waste bin implementation in the Indonesian context requires careful consideration of several vital factors. One of the primary challenges is infrastructure and network connectivity. Indonesia needs help in ensuring reliable network connectivity, especially in rural areas. A robust and widespread network infrastructure is necessary to implement smart waste bins effectively to support real-time data transmission and monitoring (Okubanjo et al., 2024).

Cost and financial sustainability also significantly impact the successful deployment of smart waste bins. The initial investment in smart waste bin infrastructure and ongoing maintenance costs can be considerable. Therefore, Indonesia must evaluate the financial sustainability of these systems and explore cost-effective solutions, such as utilizing low-cost sensors and protocols like LoRa (Azahra et al., 2023; Hanafi et al., 2024).

Community acceptance and education are crucial for successfully implementing smart waste bins. Educating the community about these bins' benefits and proper usage is essential for their acceptance. Indonesia can leverage existing community engagement programs and educational initiatives to promote the adoption of smart waste bins (Wijaya et al., 2017).

Government support and policy backing are also vital. Securing government support and establishing regulatory frameworks and incentives are essential for successfully implementing smart waste bins. Indonesia can learn from successful cases in other countries where governments have been pivotal in promoting smart waste management systems (Okubanjo et al., 2024).

By drawing lessons from successful implementations in other countries, Indonesia can effectively integrate smart waste bins into its waste management systems. Key focus areas include ensuring robust network connectivity, considering financial sustainability, promoting community acceptance through education, and securing government support and policy backing. Addressing these challenges will enable Indonesia to improve the efficiency of its waste management systems, reduce costs, and promote sustainable waste management practices.

5.3 The future research directions for the future of waste bin design in the age of automation in Indonesia

Real-time monitoring and data analysis are crucial for optimizing waste collection. Accurate and reliable data from smart waste bins can optimize routes and reduce bin emptying frequency. Improving bin design and functionality is essential for cost-effectiveness and user satisfaction (Wijaya et al., 2017). Seamless integration with existing waste management systems is critical for efficient operations. Effective community engagement is vital for widespread adoption.

Smart waste bins must be adaptable to various environments and waste types. Advancements like deep learning and image recognition can enhance functionality. Integrating sensors, IoT, and AI can optimize waste management processes. Remote monitoring and control can increase efficiency. Developing advanced sorting and classification systems will improve accuracy (Fei et al., 2024). User-friendly interfaces and scalability are essential for broader adoption. By addressing these areas, the future of waste bin design in Indonesia can be significantly improved, leading to more efficient and sustainable waste management.

6.0 Conclusion and Recommendations

Smart waste bins hold immense potential for transforming waste management in Indonesia. While the country has made strides, it still lags in automation technology compared to global leaders like Singapore and South Korea.

Indonesia must develop efficient and sustainable waste management systems to bridge this gap. This involves overcoming infrastructure, technological, and socioeconomic challenges. By investing in robust network infrastructure, exploring cost-effective solutions, and promoting public awareness, Indonesia can accelerate the adoption of smart waste bins. Promoting community engagement and education is vital for acceptance and effective implementation. Strong government support is essential to drive this

transition. By aligning with global advancements and addressing local specificities, Indonesia can create a cleaner and more sustainable future.

However, this study acknowledges limitations, such as the need for localized data on smart bin adoption and potential cost barriers for implementation in less developed areas. Additionally, the research primarily focuses on urban settings, leaving rural waste management issues underexplored.

Paper Contribution to Related Field of Study

This research advances innovative waste management by analyzing Indonesia's smart waste bin implementation potential. It identifies challenges, quantifies costs and benefits, and develops a framework for successful deployment.

References

Agarwal, V. (2019, September 25). *Automation and the future of work in Indonesia*. Https://www.Mckinsey.com/. Retrieved July 10, 2024, from https://www.mckinsey.com/featured-insights/asia-pacific/automation-and-the-future-of-work-in-indonesia

Aqilah, R. M., Elfahmi, A. S., Fariza, R., Oktalia, R. D., & Wahyudi, B. T. (2021, December). Smart Trash Can: Innovation of Automatic Trash Can with Arduino Uno-Based as an Effort to Support Global Sustainable Development Goals (SDGs) Action. In International Conference on Science and Engineering (ICSE-UIN-SUKA 2021) (pp. 203-209). Atlantis Press.

Azahra, T., Fadhli, M., & Soim, S. (2023). Low-cost Waste Management System with Multi-node Application Using Simple LoRa Protocol. Jurnal Ecotipe (Electronic, Control, Telecommunication, Information, and Power Engineering), 10(2), 170-180.

Febria, F., Marier, S. M., & Maisarah, I. S. (2023). TEMPAT SAMPAH PINTAR "MYSMARTRECYLEBIN" BERBASIS TEKNOLOGI INTERNET OF THINGS (IOT) DAN BIG DATA. JOURNAL ONLINE OF PHYSICS, 9(1), 61-65.

Fei, X., He, P., Ma, H., & Qiu, Y. (2024). Enhancing Urban Waste Management: Development and Application of Smart Garbage Bin Technologies. Science and Technology of Engineering, Chemistry and Environmental Protection, 1(5).

Hanafi, N., Yulianto, A. W., & Rakhmania, A. E. (2024). Implementation of Wireless Sensor Network on Smart Trash Bins Using LoRa With AES128 Algorithm (Case Study: Mentari Waste Bank Panceng Gresik). Journal of Telecommunication Network (Jurnal Jaringan Telekomunikasi), 14(1), 92-101.

Herawan, S. G., & Bagaskara, A. (2020, February). Design an innovative waste recycling trash bin based on the requirements from customers (Binusian) in Bina Nusantara University. In IOP Conference Series: Earth and Environmental Science (Vol. 426, No. 1, p. 012119). IOP Publishing.

Huh, J. H., Choi, J. H., & Seo, K. (2021). Smart trash bin model design and future for smart city. Applied sciences, 11(11), 4810.

Manik, S. L. C., Berawi, M. A., Gunawan, G., & Sari, M. (2024). Smart Waste Management System for Smart & Sustainable City of Indonesia's New State Capital: A Literature Review. In E3S Web of Conferences (Vol. 517, p. 05021). EDP Sciences.

Mohammed, M., Shafiq, N., Al-Mekhlafi, A. B. A., Rashed, E. F., Khalil, M. H., Zawawi, N. A., & Sadis, A. M. (2022). The mediating role of policy-related factors in the relationship between practice of waste generation and sustainable construction waste minimisation: PLS-SEM. Sustainability, 14(2), 656.

Mousavi, S., Hosseinzadeh, A., & Golzary, A. (2023). Challenges, recent development, and opportunities of smart waste collection: A review. Science of The Total Environment, 886, 163925.

Okubanjo, A., Olufemi, O. B., Okandeji, A., & Daniel, E. (2024). Smart Bin and IoT: A Sustainable Future for Waste Management System in Nigeria. Gazi University Journal of Science, 37(1), 222-235.

Prastyabudia, W. A., & Permatab, O. A. (2021). A Conceptual Design Of Waste Management: Smart Bin Deployment In Surabaya Smart City. Acta Mechanica Malaysia (AMM), 4(1), 05-09.

Saffa, A. (2024). Indonesia: Tech-driven solutions for waste management, OpenGov Asia. Available at: https://opengovasia.com/2024/06/21/indonesia-tech-driven-solutions-for-waste-management/ (Accessed: 18 July 2024).

Wijaya, A. S., Zainuddin, Z., & Niswar, M. (2017, August). Design a smart waste bin for smart waste management. In 2017 5th International Conference on Instrumentation, Control, and Automation (ICA) (pp. 62-66). IEEE.