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Transformation of Plastic Waste into 3D Art as a Campaign Medium for Marine Ecosystem Degradation

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ABSTRACT

The global issue of plastic pollution in oceans has gained significant attention, particularly in Indonesia, which boasts the second-longest coastline worldwide and grapples with severe threats to its marine biodiversity. Consequently, this study endeavors to transform plastic waste into three-dimensional artworks as a campaign medium to address marine ecosystem degradation. The creative process is structured into three distinct stages: pre-creation, creation, and post-creation. Data analysis in this study employs descriptive qualitative analysis with an artistic reflection approach. This involves interpreting data derived from literature studies, observations, experiments, and documentation to comprehend the transformation of plastic waste into three-dimensional artworks and evaluate the alignment between the concept, visual representation, and the campaign message regarding marine ecosystem damage. The creation process yields two three-dimensional artworks that visually depict the suffering of marine biota due to plastic pollution through symbolic and critical visual approaches. The incorporation of octopus and orca whale figures as symbols reinforces the narrative of entrapment, vulnerability, and mortality of marine biota caused by human-generated plastic waste. In summary, these artworks not only possess aesthetic value but also serve as effective visual communication media for conveying social criticism and moral messages to the audience. Furthermore, they encourage societal awareness and behavioral change in reducing the consumption of single-use plastics, thereby contributing to the preservation of marine ecosystems' sustainability.

KEYWORDS

Transformation, Plastic Waste, 3D Art, Campaign Medium, Marine Ecosystem

INTRODUCTION

In the modern era, plastic waste pollution in the oceans has become one of the most urgent environmental issues. Plastic waste not only affects the natural beauty of marine environments but also threatens marine ecosystems that are vital to life. Indonesia, as an archipelagic country with the second-longest coastline in the world, faces major problems related to marine pollution, in which plastic waste is one of the main contributors.

Plastic waste has become one of the primary causes of marine ecosystem degradation. It disrupts marine life, including coral reefs and fish species that are essential parts of the marine food chain. According to Wahyudin and Afriansyah, efforts to mitigate plastic waste pollution include the implementation of regulations and the reduction of plastic production at the international level (Wahyudin & Afriansyah, 2020). In addition, research shows that coral reef ecosystems have experienced significant decline due to pollution, making the protection of these ecosystems increasingly urgent (Veronika & Tajidan, 2022).

The transformation of plastic waste into 3D artworks can be carried out through various techniques and methods. Artists can innovate by creating works from unused materials, which not

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only provide aesthetic value but also convey environmental messages (Hilmawati et al., 2023). By utilizing plastic waste as a medium, this project provides a platform to educate the public about the harmful impacts of excessive plastic use. The resulting artworks function not only as aesthetic objects but also as tools to communicate important issues related to environmental sustainability.

Research by Hilmawati et al., (2023) shows that artistic expression can educate the public, especially children, about the importance of maintaining a clean and friendly environment. Through participation in the creative process, individuals can become more aware of the negative impacts of plastic waste on marine ecosystems. Art can serve as an effective visual communication medium to convey social and environmental issues to the public through symbols, forms, and materials used (Emriadi et al., 2025). Artworks created from plastic waste are able to attract public attention and stimulate discussions around environmental issues. Through this approach, artists can combine their artistic skills with social issues, creating works that are not only visually engaging but also rich in meaning (Asmatulu & Asmatulu, 2011).

After the 3D art products are realized, the next important step is organizing exhibitions or campaigns aimed at educating the public. These activities may include lectures, discussions, and art exhibitions, in which visitors gain direct knowledge about the importance of preserving marine environments and preventing pollution. This effort is in line with the recommendation of Ramdhani et al., who emphasize that active community involvement in environmental education is crucial to reducing marine pollution (Ramdhani et al., 2024).

Outreach and discussions about marine ecosystems conducted in schools or local communities can also strengthen public awareness and concern regarding this issue. Kartika et al. demonstrate that educational approaches involving children in school environments are very effective in disseminating information about marine biota and ecosystem conditions (A. G. D. Kartika et al., 2023).

The successful application of visual art in environmental campaigns also supports the creation of collective awareness toward global challenges such as marine ecosystem degradation. Hilmawati et al. (2023) show that collaborative experiences in art, such as those conducted in Cimaja Village, lead to increased environmental awareness among the children involved. This aligns with the objectives of art education, which are not limited to creating artworks but also providing broader social contexts to children regarding the impact of their actions on the environment.

The paradigm of using visual art as a tool for environmental campaigns can create synergy between artistic knowledge and environmental awareness. According to Ahmad and Julia (2022), the integration of learning media that take social and environmental issues as themes can enrich learning experiences and stimulate interest in both aspects. This is highly relevant in the context of plastic waste transformation, where individuals have the opportunity to explore and express their views on these issues through artistic media. When visual art is applied to environmental education concepts, it has the potential to create stronger interdisciplinary connections, including environmental science, sociology, and economics. By involving various stakeholders in supporting such campaigns, including artists, educators, and communities, these activities can become more structured and effective.

The works to be created have different approaches in both visual concepts and artistic ideas. Examples include “The Creative Process of Processing Low Density Polyethylene Plastic Waste” by Sastrawan et al. (2023), “Assistance in Utilizing Plastic Waste for Visual Art Typical of Malang Regency in SBDP Learning at SDM 8 Dau” by Regina et al. (2021), and “Exploration of Plastic Waste in Visual Art” by Syamsiar (2021).

In the context of the research “Transformation of Plastic Waste into 3D Artworks as a Medium for Campaigning Marine Ecosystem Degradation,” this approach aligns with contemporary art thinking that treats material as a means of conveying environmental messages. According to Dharsono Sony Kartika’s art theory, art is not merely aesthetic but also a tool for education and social communication (Maraveas et al., 2024).

Overall, the transformation of plastic waste into 3D artworks is not merely a creative activity but also serves as a means to enhance environmental awareness and education. Through this integrated approach, the resulting artworks can not only be visually appreciated but also be useful in disseminating messages about the importance of preserving marine ecosystems and the negative

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impacts of plastic waste. Therefore, synergy between art, education, and the environment needs to be fostered for a more sustainable future and higher public awareness of environmental issues.

METHOD

The creative process of this work employs the art theory approach proposed by Dharsono Sony Kartika, which views the creation of artworks as a process involving three main stages, namely exploration, design, and realization, followed by artwork evaluation (D. S. Kartika, 2017). This approach is applied because it aligns with the characteristics of three-dimensional art creation based on recycled materials, which emphasizes not only aesthetic aspects but also conceptual values and social messages. Dharsono explains that the process of creating artworks involves stages of conceptual planning, visualization, and evaluation. These stages correspond to the division of pre-creation (planning), creation (visualization process), and post-creation (evaluation and reflection).

At the pre-creation stage, the author conducted theme exploration through literature studies and observations of marine pollution problems caused by plastic waste, which were then developed into artistic ideas using the symbolization of fish as representations of marine biota vulnerable to the threats of plastic debris. The creation stage was carried out by realizing these concepts into three-dimensional artworks through the exploration of recycled materials, using discarded cardboard as the framework, newspaper as the forming layer, and plastic waste as the main surface material to build textures and visuals that represent the endangerment of marine ecosystems. Furthermore, the post-creation stage was conducted through artistic evaluation and reflection on the aesthetic aspects and symbolic meanings of the artworks, in order to assess the suitability between the presented visuals and the campaign message on marine ecosystem degradation intended to be conveyed to the audience.

The data analysis technique in this study employs descriptive qualitative analysis with an artistic reflection approach. The analysis was conducted by interpreting data obtained from literature studies, observations, experiments, and documentation to understand the process of transforming plastic waste into three-dimensional artworks. The analysis focuses on the relationship between the concept, creative process, material usage, visual form, and the symbolic meaning of the artworks in conveying the campaign message on marine ecosystem degradation. The results of the analysis are used to assess the alignment between conceptual ideas, visual representation, and the function of the artworks as environmental communication media.

RESULT AND DISCUSSION

The creative process consists of three main stages, namely pre-creation, creation, and post-creation.

1. Pre-creation Stage

At the pre-creation stage, data were collected through literature studies, observations of plastic waste issues, and the exploration of visual ideas relevant to the problem of marine ecosystem degradation. The author's personal experiences regarding marine pollution caused by plastic waste became the basis for developing the artistic concept at this stage. Awareness of the negative impacts of plastic waste on marine ecosystems was processed into an aesthetic experience that stimulated the emergence of ideas to transform low-value discarded materials into meaningful 3D artworks rich in symbolic significance. From this process, the concept of fish symbolization emerged as a representation of marine biota vulnerable to the threats of plastic pollution. The author's initial visualization is as follows.

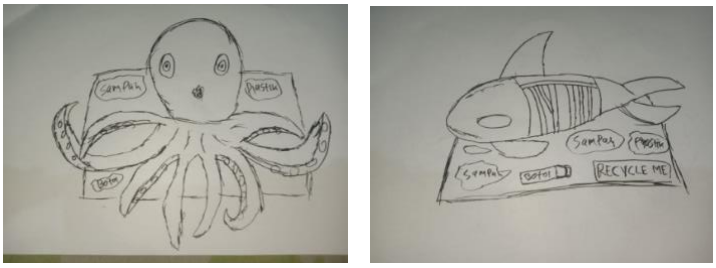

Figure 1. Sketch

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The use of art to raise awareness of plastic pollution in the oceans is one of the most effective approaches. According to Qoyyuumu and Mudjiati (2024), the creation of artworks from plastic waste functions as a form of visual educational tool that confronts society with the reality of marine pollution and conveys environmental messages powerfully, because such works not only possess aesthetic value but are also able to communicate the threats of ocean pollution to the public. The tools and materials used include scissors, cutters, discarded cardboard, plastic waste, straws, and glue.

2. Creation Stage

The creation stage includes media experimentation by utilizing plastic waste as the primary material, designing the form of the 3D artworks, and realizing the works in accordance with the predetermined campaign concept. The tools and materials used in the creation of these artworks consist of discarded cardboard as the basic framework, newspaper to cover and shape the form, and plastic waste as the main surface material. The selection of these materials aims to emphasize the campaign message regarding the impact of plastic pollution in the oceans, while simultaneously utilizing recycled materials that are easily found in the surrounding environment. The use of waste materials in artworks is not only intended to enhance their functional value but also to add aesthetic value and conceptual meaning related to environmental sustainability issues (Pambudi et al., 2025). Rahman and Tuharea's research also shows that training activities in recycling plastic bottle waste not only improve students' skills but also increase their awareness of the 3R practices (Reduce, Reuse, Recycle) by 40% (Rahman & Tuharea, 2021).

The transformation of plastic waste into 3D artworks can be viewed as a form of artistic statement that reflects the phenomenon of environmental pollution caused by plastic waste. Furthermore, transforming plastic waste into three-dimensional artworks not only emphasizes visual aesthetic aspects but also functions as a medium of environmental communication that conveys critical messages about marine ecosystem degradation (Syifa, 2025). The creation process is as follows.

Figure 2. The Creation Process

The creation process begins by assembling cardboard into a structure resembling a fish, symbolizing marine biota that are most affected by plastic waste. After the framework is completed, the surface of the artwork is covered with newspaper to strengthen the form and prepare it to receive the next layer. The final stage is carried out by covering the entire form with pieces of plastic waste, creating textures and visualizations that strongly represent the endangerment of marine ecosystems caused by plastic debris.

The 3D artworks produced from plastic waste can be accessed and recognized by the public. The production process that utilizes recycled materials not only reflects creativity but also emphasizes the aesthetic value generated from the material context. Zhang et al. demonstrate that new techniques relying on mild conditions in plastic recycling enable materials to be transformed efficiently and in an environmentally friendly manner (Zhang et al., 2020). By combining artistic sensibility and technology, artists can use plastic waste to create works that evoke emotion and convey important messages about sustainability (Zhang et al., 2020). This approach aligns with Dharsono's objective of creating artworks regarded as reflections of social and environmental

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realities, as well as active efforts to transform them (Maraveas et al., 2024).

3. Post-creation Stage

Furthermore, the post-creation stage was conducted by evaluating the artworks in terms of aesthetic aspects, including form, composition, materials, and the resulting visual neatness. This evaluation aims to ensure that the artworks possess adequate artistic quality and are capable of attracting the audience's attention as campaign media. In addition, the symbolism contained in the artworks was analyzed to assess the suitability between the presented visuals and the environmental messages intended to be conveyed. This stage also includes an assessment of the effectiveness of the artworks as media for campaigning marine ecosystem degradation. A process of personal reflection was carried out to measure the extent to which the artworks successfully represent the creator's ideas, while consultations with the academic supervisor functioned as academic validation of the feasibility and appropriateness of the artworks.

The results of this creation produced two three-dimensional artworks based on plastic waste that emphasize the issue of marine ecosystem degradation caused by plastic pollution as a medium for environmental campaigning. Through a symbolic approach, each visual element in the artworks is designed to represent the vulnerability of marine biota and the impact of human activities on aquatic environments. The use of plastic waste as the main medium not only presents aesthetic value but also strengthens the persuasive campaign message, enabling the artworks to function as effective visual communication media in building audience awareness and concern regarding marine pollution issues. The first artwork is presented in the figure below.

Figure 3. Plastic Inhabiting the Sea

Specifications
Title : Plastic Inhabiting the Sea
Artist : Syamaidzar Dzakwan Abdi Qohar
Size : 50 × 30 cm
Year : 2025

This artwork takes the form of a three-dimensional octopus, with its body and tentacles constructed from a simple framework and then covered with black plastic. The eyes are detailed with orange and white colors to emphasize the octopus's expression. The artwork is placed on a base filled with various types of plastic waste, such as food packaging, bottles, and single-use plastics. The combination of the octopus figure and plastic waste creates a strong visual composition while simultaneously conveying a critique of marine pollution.

The use of black color on the octopus's body creates a gloomy and threatening impression that visually reinforces the narrative of the marine environmental crisis caused by plastic pollution. Such visual strategies are commonly employed in contemporary environmental art to evoke the audience's emotional awareness of ecological crises (Chertkovskaya et al., 2020). The tentacles extending in various directions enhance the impression of entrapment and vulnerability, representing the condition of marine biota that struggle to escape the grip of human waste. The presence of actual plastic waste

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on the base of the artwork adds a sense of realism, allowing the audience to directly recognize the environmental issues being addressed. Aesthetically, this artwork combines a symbolic approach with contextually appropriate materials, namely discarded plastic that constitutes the main problem in marine pollution. According to Syamsiar (2021) and Qoyyuumu and Mudjiati (2024), the use of real plastic waste as artistic material not only enhances realism but also reinforces the function of plastic as the primary symbol of marine pollution issues in contemporary visual art practice.

The meaning conveyed through this artwork is a representation of the suffering of marine biota caused by plastic waste that increasingly pollutes the oceans. The octopus is chosen as a symbol because it is one of the most intelligent marine animals, yet highly vulnerable to environmental degradation. The position of the octopus, seemingly surrounded by plastic waste, illustrates the entrapment of marine creatures in human-generated debris. This is consistent with research by Costa et al. (2025), which states that plastic waste enveloping marine environments causes various negative impacts on marine organisms, including ingestion, entanglement, and disturbances to their biological systems. Thus, this artwork functions as a visual campaign medium that not only presents aesthetic value but also delivers a moral message to raise public awareness about the importance of maintaining ocean cleanliness and reducing the use of single-use plastics, in line with studies showing that artistic interventions can enhance public understanding and awareness of marine pollution (Anvika Khaitan, 2024). The second artwork is presented in the figure below.

Figure 4. Plastic Behind the Waves

Specifications
Title : Plastic Behind the Waves
Artist : Syamaidzar Dzakwan Abdi Qohar
Size : 50 × 15 cm
Year : 2025

This artwork presents a three-dimensional form resembling an orca whale, featuring the characteristic black-and-white coloration of the species. On the side of the body, the rib structure is visible, constructed from rolled paper or similar materials, with the interior appearing to be filled with various types of plastic waste such as food packaging, straws, plastic spoons, and single-use containers. The artwork is placed on a base that is also covered with plastic waste, creating a strong visual atmosphere and a striking contrast between the form of the marine creature and human-generated debris.

Visually, this artwork combines symbolic realism and a critical approach by using the orca whale as the main subject, making it not only an icon of strength but also a symbol of the fragility of marine biota exposed to plastic pollution. Ecological studies show that plastics and microplastics accumulate in the digestive tracts of marine mammals, including whales and other cetaceans, which can cause severe digestive disorders and even death (Zantis et al., 2021). The exposed abdominal section filled with plastic waste creates a dramatic effect while highlighting the fact that many marine animals die from ingesting plastic. Moreover, the aesthetic approach that combines the black-and-white identity of the orca's body with the colorful plastic waste inside it produces a strong visual contrast and irony, emphasizing the paradox between the animal's natural identity and the

anthropogenic impact on its habitat. Artworks that visually present the plastic crisis have been proven effective in making the issue visible and emotionally experienced by the public (Chertkovskaya et al., 2020).

The meaning of this artwork is a social critique of human behavior that disposes of plastic waste into the ocean without considering its consequences. The orca whale is used as a symbol to represent the suffering of marine biota that cannot distinguish between natural food and plastic. The openness of the abdominal section, revealing ribs and plastic-filled contents, serves as a visual metaphor for the tragic reality that many marine animals die with stomachs full of plastic. Other studies also describe how microplastics and macroplastics broadly affect marine ecosystems, including through consumption by marine fauna that mistakenly identify plastic as part of their food (Li et al., 2016). This artwork functions as a campaign medium that invites the audience to reflect on the impacts of everyday habits and encourages behavioral change to reduce the use of single-use plastics in order to protect marine ecosystems. Various artworks addressing marine pollution demonstrate that the visualization of pollution can serve as an educational medium and social campaign, prompting audiences to contemplate the consequences of daily practices and motivating behavioral change such as reducing single-use plastic consumption to save marine ecosystems (Munandar & Akbar, 2024).

CONCLUSION

The process of creating these three-dimensional artworks based on plastic waste went through three main stages, namely pre-creation, creation, and post-creation, which are interconnected in building the ideas, visuals, and meanings of the artworks. The pre-creation stage focused on data collection, observation, and the exploration of visual ideas derived from the problem of marine pollution caused by plastic waste. These ideas were then realized in the creation stage through the use of recycled materials such as cardboard, paper, and plastic waste, which not only increased the functional value of discarded materials but also reinforced the conceptual message regarding the vulnerability of marine ecosystems. The post-creation stage was carried out through aesthetic evaluation and reflection on symbolic meanings to ensure that the artworks possessed adequate visual quality and were able to function as environmental campaign media.

The results of the creation process produced two three-dimensional artworks representing the suffering of marine biota due to plastic pollution through symbolic and critically visual approaches. The use of the octopus and orca whale figures as symbols strengthens the narrative of entrapment, vulnerability, and death of marine biota caused by human-generated plastic waste. Overall, these artworks not only present aesthetic value but also function as effective visual communication media in conveying social criticism and moral messages to the audience, as well as encouraging public awareness and behavioral change to reduce the use of single-use plastics in order to maintain the sustainability of marine ecosystems.

Nevertheless, this study has limitations, as it remains reflective in nature and is based on the author's personal experience. The validity of the symbolic messages conveyed by the artworks has not yet been widely tested through direct engagement with audiences or communities. Therefore, the effectiveness of the artworks as campaign media still requires further investigation. As directions for future research, it is recommended to involve respondents directly in the artwork evaluation process, either through surveys, interviews, or discussion forums. In addition, future studies may conduct comparative research using other artistic approaches, such as installation art, performance art, or digital media, to examine how differences in media influence the appeal and effectiveness of environmental campaigns. Through these steps, the contribution of art to marine conservation issues can become broader, more contextual, and have a tangible impact on society.

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