Research Article

From Earth to Art: Repurposing Clay Residues into Ephemeral Clay Sculptures of Organic Art and Styles

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The ceramic and sculpture studios generate significant amounts of clay residues, which often end up in landfills, contributing to environmental degradation. This study explores the latent of repurposing these waste materials into ephemeral clay sculptures, addressing both waste management issues and creating opportunities for innovative artistic expression. The research employed a qualitative approach, combining machine milling with artistic experimentation. Clay residues from local ceramic and sculpture art studios were collected, analyzed for composition, and processed to enhance their sculptural properties. A series of workshops with artists explored various techniques for creating ephemeral clay sculptures using these reclaimed materials. The resulting artworks were documented and analyzed for their aesthetic and conceptual advantages; contemporary artistic trends and methodologies; cultural and environmental repercussions. Clay residues, when properly processed, proved suitable for creating flexible yet intentionally temporary sculptures. The unique properties of the reclaimed clay led to distinctive structures and forms; inspiring new artistic styles reminiscent of organic, earth-based art. The ephemeral nature of the sculptures encouraged artists to explore themes of impermanence, environmental cycles, and the relationship between art and nature.

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1. Introduction

The process of working with clay involves a deep understanding of its properties and behavior, as artists manipulate its form and texture to create intricate sculptures and pottery (Sholt & Gavron, 2006; Canton,

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2024). Nielsen (2024) is of the view that from shaping the clay on a wheel to firing it in a kiln, each step in the process requires skill and creativity to bring the artist's vision to life. The transformation of raw clay into a finished piece is a testament to the artist's ability to harness the natural elements and mold them into something beautiful and meaningful. Clay's malleability and versatility make it a popular medium for artists seeking to explore themes of nature, sustainability, and the environment (Sample, 2021; Watson, 2023). Artists create pieces that not only reflect the beauty of the natural world but also raise awareness about the importance of preserving it by using clay remnants and other natural materials in their work (Davis, 2020). Through their art, these artists are able to communicate powerful messages about the interconnectedness of all living things and the need to protect our planet for future generations (Noce, Faro & Sciuto, 2021).

Residues of clay, produced during the process of sculpting, are often disposed of, adding to environmental degradation and waste accumulation. Nonetheless, recent developments in sustainable art have shed light on the potential of these residues as valuable artistic mediums (Asamoah et al., 2022; Hernández García, Monteiro & Lopera, 2024). Through the reutilization of clay residues, artists not only decrease waste but also craft unique, fleeting pieces that resonate with the themes of impermanence and natural cycles (Sampah et al., 2024; Asare et al., 2023). The idea of nature art, which involves producing art within and using elements from nature, often underscores the transient and ever-changing characteristics of the natural world (McArdle, 2024). When clay residues are incorporated in this setting, they epitomize the ephemeral beauty of natural materials and the evolving bond between humanity and the environment. This approach not only challenges traditional art conventions but also inspires viewers to connect with the natural world in novel and meaningful ways (Reynolds, 2023; Beardsley, 2006). Through the analysis of clay residues in nature art, this study intends to illuminate the creative techniques that reshape artistic representation and ecological awareness (Vuorinen, 2022). Furthermore, the study aims to explore the impact of these techniques on artistic trends, promoting a transition towards more natural and eco-friendly art forms (Down, 2023; Falin, 2022). Viewing clay residues as a potential medium for nature art highlights the ongoing conversation between art, nature, and sustainability.

Jean (2019) supports that the repurposing clay residues into nature art and its impact on artistic styles presents a challenge that intersects environmental sustainability, artistic innovation, and cultural perception. Traditional sculpting processes generate significant amounts of clay waste, which are often discarded, leading to environmental concerns (Lozano-Miralles et al., 2018). This problem is exacerbated by the increasing demand for sustainable practices in art, which calls for a reevaluation of how materials

are sourced and utilized (Asare et al., 2023; Emmanuel, Gidigasu & Gawu, 2020). It is a significant challenge to rethink these clay remnants as valuable artistic resources instead of discarding them as waste. Again, Lozano-Miralles et al. (2018) share that this transformation demands artists to embrace creative methods and strategies that not only reduce waste but also enrich the visual and conceptual aspects of their artwork. Incorporating clay residues into environmental art presents an appealing resolution by advocating for sustainability and presenting a distinctive medium that encapsulates the concepts of transience and natural allure (Jean, 2019; Bhatnagar, 2014).

In addition, the inclusion of clay leftovers in the realm of artistic expressions has a profound impact on the development of artistic trends (Arcual, 2023). Traditional art forms often stress the importance of endurance and resilience, whereas nature-inspired art, particularly when utilizing fleeting materials like clay remnants, challenges these traditional viewpoints. This transformation paves the way for the creation of innovative artistic styles that embrace transience, organic structures, and environmental interconnectedness (Pharr, 2024; Beardsley, 2006). This shift carries significant cultural implications. It prompts a reconsideration of societal attitudes towards waste and worth, leading to a deeper comprehension of the interconnectedness between human actions and the environment (Asamoah et al., 2022; Ikhwan et al., 2021). This study nurtures a more sustainable and comprehensive perspective of art and its societal function by showcasing the creative possibilities of discarded materials (Jean, 2019; Rice, 2015). The study aims to investigate the following key inquiries: (1) What are the aesthetic and conceptual advantages of incorporating clay residues into nature art? (2) How does the utilisation of clay residues affect contemporary artistic trends and methodologies? (3) What are the cultural and environmental repercussions of reimagining clay residues as artistic mediums?

The exploration of the potential for clay residues to be transformed into nature art and its impact on artistic styles is an area that has received relatively little attention within the realms of art and sustainability (Boeckel, 2014). While there is a substantial body of literature on sustainable art practices and the utilisation of natural materials in art, there is a lack of specific research that centers on clay residues as a medium for organic art (Walshe, Perry & Moula, 2023). This gap highlights the need for a more concentrated inquiry into the techniques, aesthetic considerations, and environmental advantages of incorporating clay residues into nature art (Jean, 2019; Blanc & Benish, 2016).

2. Framework: Theoretical perspective

The study adopted material engagement theory (MET), proposed by Lambros Malafouris (2013), as a compelling framework for comprehending the conversion of clay residues into nature art and its influence on artistic styles and contextual perceptions (March, 2017; Prezioso, 2021). MET suggests that cognition is not limited to the brain but is distributed throughout the body, objects, and surroundings, highlighting the dynamic interplay between humans and materials. Central to MET is the notion that materials actively participate in the cognitive processes of creation. Malafouris (2013) contends that the interaction with materials is not merely a passive engagement but a crucial element in how humans think, learn, and innovate. This perspective shifts the emphasis from the final product to the process of material engagement, emphasizing the cognitive and creative potentials inherent in working with clay residues. Regarding the transformation of clay residues into nature art, MET elucidates how artists perceive and engage with these materials. The textures, colors, and shapes of clay residues impact the artist's cognitive and creative processes, resulting in novel artistic expressions that challenge conventional standards. This interaction underscores the material's role in shaping artistic cognition and production (Malafouris, 2013; 2014; 2019).

2.1. Distributed Agency and Ephemeral Art

MET also introduces the concept of distributed agency (Rammert, 2008), where agency is not solely attributed to the human creator but is shared between the creator and the materials. In nature art, especially with ephemeral materials like clay residues, this distributed agency becomes evident (Küttel, 2024; Reynolds, 2023). The natural processes of weathering and erosion contribute to the artwork's evolution, emphasizing the material's active role in the creative process (Botella, Zenasni & Lubart, 2018). Artists create works that are not only about their own vision but also about the material's intrinsic properties and behaviors by embracing this distributed agency (Gabriel, 2021). This approach aligns with the principles of nature art, where the environment and materials play a crucial role in the artistic outcome (Knappett & Malafouris, 2008).

MET encourages a deeper awareness of the material world and its implications, promoting a material consciousness that aligns with sustainable art practices (Alahira, et al., 2024; Asamoah et al., 2022). The theory suggests that by engaging with materials in a mindful and deliberate manner, artists can develop a greater appreciation for the material's origins, properties, and potential impacts on the environment (Malafouris, 2013). This material consciousness is crucial in transforming clay residues into art. Artists

not only repurpose waste materials but also engage in a practice that promotes sustainability and environmental stewardship (Sampah et al., 2024). This shift in perspective leads to broader cultural changes in how society views waste and value, as suggested by the principles of MET.

2.1.1. Aesthetic and Concepts

The application of MET to the use of clay residues in nature art has significant aesthetic and conceptual implications. The theory highlights the importance of the material's role in shaping artistic expression and the viewer's perception (Bueno, Motta & Tumas, 2020). MET provides a framework for understanding how the unique properties of clay residues can lead to new artistic styles that emphasize impermanence, organic forms, and the interconnectedness of art and nature by focusing on the material engagement process (Noce et al., 2021; Ingold, 2022). This theoretical approach allows for a richer exploration of how clay residues can be transformed into nature art, suggesting insights into the cognitive, aesthetic, and environmental dimensions of this practice (Nortey, Amoanyi & Donkor, 2023). By integrating MET into the study of clay residues in art, the study looks at deeper layers of meaning and innovation in contemporary artistic practices.

Existing studies on sustainable art practices often highlight the importance of reusing materials but lack comprehensive methodologies for transforming specific waste products like clay residues into viable artistic media (Sharghi & Jeong, 2024). While Almusaed, Yitmen and Almssad (2024) and Sampah et al. (2024) discuss various sustainable practices in art, the detailed processes and techniques for repurposing clay residues are not sufficiently addressed. There is a need for a systematic framework that guides artists in effectively utilizing these materials, from collection and preparation to integration into artistic works. The aesthetic potential of clay residues as a medium for nature art is another area that requires deeper exploration (Zhang & Wei, 2024; Asamoah et al., 2018). Current research tends to focus on the broader category of natural materials without delving into the unique qualities and creative possibilities offered by clay residues. Beardsley (2006) touches on the concept of ephemeral art in nature but does not specifically explore how clay residues can contribute to this genre. Understanding the textural, colouristic, and structural properties of clay residues could significantly enrich the aesthetic discourse in nature art.

2.1.2. Influence on Contemporary Artistic Styles

The impact of using clay residues on contemporary artistic styles and practices is an aspect that remains largely unexplored. Traditional art forms prioritize permanence and durability, while nature art often emphasizes temporality and organic forms (Nortey & Bodjawah, 2022). The use of clay residues challenges these conventions and offers new stylistic avenues for artists. However, as Nortey and Bodjawah (2022) hint that more research is needed to document and analyze how these materials influence artistic expression and stylistic evolution over time.

Finally, the broader cultural and environmental implications of reimagining clay residues as artistic materials are not well-documented (Jean, 2019; Noce et al., 2021). Noce et al. (2021) further provide insights into the historical and cultural significance of clay but does not address the contemporary shift towards sustainability and waste reduction in art. Investigating how the use of clay residues in art can alter societal perceptions of waste and value, and contribute to environmental consciousness, is crucial for a comprehensive understanding of this practice (Rio et al., 2022; Oti, Kinuthia & Robinson, 2014).

At the core of MET is the idea that materials play an active role in the cognitive processes of creation. Malafouris (2013, 2014, 2019) argues that the engagement with materials is not merely a passive interaction but a fundamental aspect of how humans think, learn, and create. This perspective shifts the focus from the end product to the process of material engagement, highlighting the cognitive and creative potentials embedded in the manipulation of clay residues. In the context of transforming clay residues into nature art, MET helps explain how artists perceive and interact with these materials. The textures, colours, and forms of clay residues influence the artist's cognitive and creative processes, leading to innovative artistic expressions that challenge traditional norms. This interaction underscores the material's role in shaping artistic cognition and output (Malafouris, 2019; Karana et al., 2015).

3. Methods

3.1. Research design

This study employs qualitative research approach to investigate the process and implications of repurposing clay residues into ephemeral ceramic sculptures. Qualitative research approach involves the collection and analysis of non-numerical data to gain an in-depth understanding of a particular phenomenon (Tenny, Brannan & Brannan, 2022; Sutton & Austin, 2015). This method allows researchers to explore complex social and behavioural issues in their natural settings, using techniques such as

interviews, observations, and content analysis (Tenny et al., 2022; Hammarberg, Kirkman & Lacey, 2016). Busetto, Wick and Gumbinger (2020) express that qualitative research provides valuable insights that informed theory and practice in various fields by focusing on the subjective experiences and perspectives of participants. The research was divided into three phases: material collection and preparation, artistic creation, and evaluation.

3.1.2. Material collection and preparation with Data collection

Phase 1: Collection of Clay Residues

Sources: Clay residues was collected from local pottery studios, ceramic workshops, and art schools.

Documentation: Each batch of clay residue was documented, noting its origin, type of clay, and any previous treatments (e.g., firing, glazing).

Preparation of clay residues and sorting: Residues was sorted based on texture, colour, and composition (Groot et al., 2017).

Processing: Larger chunks were broken down, and all residues were sieved to remove impurities. The resulting material was categorized into fine, medium, and coarse textures.

Hydration: The sorted residues were rehydrated to restore plasticity. This involved mixing with water and kneading to achieve a workable consistency. In the first stage, researchers were tasked with collecting clay remnants from various sources such as pottery studios, construction sites, and natural deposits (Holterman, 2007). These materials were then processed and prepared for artistic use through techniques such as wedging, kneading, and shaping. The goal of this stage was to understand the initial state of the clay and how it can be transformed into a workable medium for artistic expression.

Phase 2: Artistic creation

Artistic inspiration: Researchers draw inspiration from natural forms and processes, focusing on themes of impermanence and organic aesthetics.

Design process: Sketches were created to plan the ephemeral clay sculptures. Emphasis was on integrating the unique properties of clay residues.

Sculpture creation and techniques: Various ceramic techniques such as hand-building, slab construction, and coiling were employed. Researchers experimented with the textures and forms of the clay residues.

Integration with nature: Sculptures were designed to interact with natural environments. This included considering how they would weather and degrade over time. The second stage involved the actual

creation of ceramic artworks using the prepared clay remnants. Researchers were encouraged to experiment with different techniques such as hand-building, wheel-throwing, and sculpting to create unique and innovative pieces. The focus of this stage was on the creative process and the ways in which the researchers engage with the material to produce their artworks.

Phase 3: Evaluation

Artistic evaluation and criteria: Aesthetic value, innovation, and alignment with the themes of nature and ephemerality (Alon–Mozes & Heller, 2022; Berthon et al., 2009).

Environmental impact assessment

Life Cycle Analysis (LCA): Assessment of the environmental footprint of using clay residues compared to traditional materials (Lozano-Miralles et al., 2018; Narayana Sarma & Vinu, 2023).

Sustainability metrics: Reduction in waste, energy consumption, and resource utilization (Li et al., 2023).

Cognitive and perceptual study

Interviews and surveys: Gathering data from 20 participants, including artists and viewers, to explore their perceptions of clay residues and the resulting artworks. The study has observed greater collaboration among ceramicists, environmental artists, and land art practitioners, resulting in innovative hybrid art forms. Qualitative feedback was obtained from art critics, peers, and the general public through exhibitions and interactive installations (Mohajan, 2018).

Observation: Documenting the interaction of viewers with the sculptures in natural settings.

In the final stage, the ephemeral clay works were assessed in terms of their aesthetic value, technical skill, and conceptual depth. Researchers reflected on their creative process, the challenges they faced, and the outcomes of their work. The goal of this stage was to understand the impact of transforming clay remnants into temporary clay artworks on the participants' artistic practice and personal development.

3.3. Study area

The study was situated within the art studios of the Ceramics and Sculpture Departments at Takoradi Technical University (TTU) in Takoradi, Ghana. TTU is known for its emphasis on practical and technical education, with a strong focus on the arts, particularly in ceramics and sculpture. The university's art studios provide a dynamic environment for both students and faculty to engage in creative exploration and production. Takoradi and its surrounding areas have a great tradition of pottery and ceramics, deeply rooted in the cultural practices of the local communities. The region's abundant clay deposits have

historically supported a thriving pottery industry, with artisans producing a wide range of functional and decorative items. This tradition not only reflects the artistic heritage of the region but also provides a sustainable livelihood for many local craftsmen (Zbuchea, 2022; Karakul, 2019).

In the art studios, the ceramics and sculpture departments generate considerable amounts of clay residues, which are typically seen as waste. These residues are by-products of the pottery-making process, including trimming scraps, broken pieces, and excess material. The accumulation of these residues poses both environmental and economic challenges, as they are often discarded without any further use, contributing to waste management issues (Andreola et al., 2016; Ceraspace, 2023). The study area is particularly relevant for this research because it offered a good source of clay residues that were repurposed into art. The local pottery traditions, coupled with the availability of materials, make these departments in TTU an ideal location to explore the transformation of these residues into ephemeral sculptures that align with organic art and sustainable practices.

3.4. Data Analysis

The data analysis involved thematic and visual analysis tools that were used to analyze the use of colour, composition, texture, and other visual elements to understand the meaning and message conveyed by the artwork (Maguire & Delahunt; 2017; Trombeta & Cox, 2022). Thematic analysis was used to identifying key themes and insights from interviews, and feedback whereas visual Analysis was used to examine the aesthetic qualities and artistic styles of the sculptures. These analysis tools also considered the historical and cultural context in which the artwork was created, as well as the artist's intentions and influences (Lochmiller, 2021). These types of analysis tools are often used in art history, cultural studies, and anthropology to gain a deeper understanding of visual culture and its impact on society. Both analysis tools were valuable for the researchers in various fields, allowing them to explore and interpret the densities of human expression and communication.

3.5. Ethical Consideration

In conducting the research on repurposing clay residues into ephemeral ceramic sculptures, it was crucial to adhere to ethical principles that ensure the well-being of participants, the integrity of the research process, and the sustainability of environmental practices. Obtaining informed consent was a fundamental ethical requirement in research involving human participants. This process involved providing potential participants with comprehensive information about the study's purpose, procedures,

potential risks, and benefits, allowing them to make an informed decision about their participation (Israel & Hay, 2006). In this study, informed consent was sought from all participants involved in interviews and surveys. Sustainability was a critical consideration in the collection and use of clay residues. The research ensured that these practices do not negatively impact local ecosystems or communities. The environmental footprint of sourcing and processing clay residues were minimized, aligning with sustainable art practices (Kagan, 2011). Again, maintaining transparency in the documentation and reporting of methods and findings was essential for the integrity of the research. Transparency involved openly sharing the research design, data collection methods, analysis processes, and findings, allowing for scrutiny and validation by the broader academic and artistic communities (Resnik, 2020).

4. Results

4.1. Aesthetic and conceptual advantages of incorporating clay residues into nature art

The aesthetic and conceptual benefits of integrating clay remnants into environmental artwork were discovered through experimentation and exploration of the material's unique properties. The researchers found that incorporating clay remnants into their work added a sense of texture and depth, creating a tactile and visually engaging experience for viewers (Sampah et al., 2024; Zhang & Wei, 2024). Additionally, the use of clay remnants in environmental artwork allowed for a deeper connection to the natural world, as the material is derived from the earth itself. This integration also served as a commentary on sustainability and the importance of repurposing and reusing materials in art, highlighting the concept of environmental stewardship (Jean, 2019; Asamoah et al., 2022). These arguments go to confirm Asare et al. (2023) that the incorporation of clay remnants into environmental artwork provided the researchers with a new avenue for creative expression and a means to convey meaningful messages about our relationship with the environment. Clay residues, when properly processed, proved suitable for creating durable yet intentionally temporary sculptures. The unique properties of the reclaimed clay led to distinctive textures and forms; inspiring new artistic styles reminiscent of organic, earth-based art (Nortey & Bodjawah, 2022). The ephemeral nature of the sculptures encouraged artists to explore themes of impermanence, environmental cycles, and the relationship between art and nature. The process reduced waste clay in landfills in the study area, demonstrating significant environmental benefits (Arcual, 2023).

The varied composition of clay residues resulted in a rich palette of earth tones and textures, enhancing the visual appeal of the sculptures. Imperfections and irregularities in the reclaimed clay created unique surface qualities that were difficult to replicate with unconventional materials, adding depth and character to the artworks (Bhatnagar, 2014; Sample, 2021). The malleability of the recycled clay allowed for intricate, organic forms that seamlessly integrated with natural surroundings (Almusaed et al., 2024). Davis (2020) confirms that the technique of recycling clay materials in creating art provided a powerful metaphor for regeneration and transformation, resonating with audiences on an emotional and intellectual level (Bueno et al., 2020). The ephemeral nature of the sculptures sparked discussions about the transience of human creations in contrast with natural cycles, encouraging reflection on environmental sustainability (Blanc & Benish, 2016). Researchers reported a deeper connection to their materials and the environment, leading to more thoughtful and environmentally conscious artistic practices (Jean, 2019). The project bridged the gap between industrial waste and fine art, challenging traditional notions of artistic materials and processes.

4.2. Utilisation of clay residues affect contemporary artistic trends and methodologies

The use of clay residues has sparked a renewed interest in material-driven art (Karana et al., 2015), where the properties of the medium significantly influence the final form and concept. A new aesthetic category emerged, characterized by raw textures, earthy colours, and forms that deliberately showcase the material's origin and imperfections (Canton, 2024). The researchers developed new techniques to work with the variable composition of clay residues, enhancing their adaptability and problem-solving skills. This argument goes to support Noce et al. (2021) that the use of local clay residues has reinforced the importance of site-specificity in sculpture, with researchers creating artworks that respond directly to their environmental context (Oti et al., 2014). The ephemeral nature of the sculptures has led to increased focus on documentation and time-based artistic processes, including time-lapse photography (Vuorinen, 2022).

Clay waste, which is often discarded as a byproduct of industrial processes, has become a valuable resource for contemporary artists seeking to explore sustainable and environmentally friendly practices (Rio et al., 2022; Noce et al., 2021). The researchers were able to not only reduce their environmental impact but also create unique and recyclable pieces that challenge traditional notions of art-making by repurposing clay waste in their work (Sampah et al., 2024; Asamoah et al., 2022). The utilisation of clay waste in contemporary art has opened up new possibilities for experimentation and creativity. The

researchers were able to manipulate the material in ways that were previously not thinkable, leading to the development of new techniques and approaches to sculpting. This has resulted in a resurgence of interest in clay as a medium for artistic expression, with artists pushing the boundaries of what is considered possible with this versatile material (Canton, 2024).

Furthermore, the use of clay waste in art served as a powerful statement on the importance of sustainability and the need to rethink our relationship with the environment (Noce et al., 2021). The researchers were able to raise awareness about the impact of clay waste on the environment and inspire others to consider more eco-friendly practices in their own lives (Asamoah et al., 2022). The utilisation of clay waste in contemporary art has had a profound impact on artistic methods and strategies, leading to a reimagining of traditional practices and a greater emphasis on sustainability and environmental consciousness (Jean, 2019).

4.3. Cultural and environmental repercussions of reimagining clay residues as artistic mediums

The cultural and environmental impacts of repurposing clay remnants as artistic materials were discovered to be significant. Repurposing clay remnants as artistic materials had cultural implications. The researchers were able to connect with traditional pottery-making practices and pay homage to the history and heritage of ceramics by incorporating clay residues into their work (Nortey & Bodjawah, 2022). This process helped to preserve and promote cultural traditions, while also adding a unique and personal touch to their artwork. The artistic process has the potential to have a positive impact on both the environment and cultural heritage. It allowed the researchers to create beautiful and meaningful pieces while also promoting sustainability and preserving traditional practices (Rio et al., 2022).

The study initiated a cultural shift in perceiving industrial by-products, transforming "waste" into a valuable resource for creative expression. There has been a renewed interest in traditional clay-working techniques, particularly those that align with sustainable practices (Almusaed et al., 2024). The study reduced clay waste in both ceramic and sculpture studios, TTU, demonstrating significant environmental benefits. Again, utilising local clay residues decreased the carbon footprint associated with sourcing and transporting new art materials (Asamoah et al., 2018). The ephemeral nature of the clay sculptures ensured they naturally decompose, minimizing long-term environmental impact (Noce et al., 2021). Some clay sculptures have shown potential for creating microhabitats for local flora and fauna as they degrade. There was a growing cultural acceptance and appreciation of transient art forms, aligning with

natural cycles of decay and renewal. The site-specific nature of these clay sculptures enhanced the cultural identity of local landscapes, creating new landmarks and points of community pride as indicated in Figure 1.

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Figure 1. Ephemeral clay sculptures with different forms, textures and shapes

4.4. Audience responses

Understanding audience responses was crucial for evaluating the impact and effectiveness of repurposing clay residues into ephemeral ceramic sculptures. The audiences, including art lecturers, students, professional artists, and the general public, provided valuable feedback on the aesthetic, conceptual, and environmental aspects of the artworks. These responses were gathered through various methods, including surveys, interviews, observation, and engagement during exhibitions. Public engagement with the ephemeral sculptures was notably high, with surveys indicating increased awareness of environmental issues and waste management among viewers. When analyzing audience responses to the ephemeral ceramic sculptures made from repurposed clay residues, a variety of reactions were expected. These responses were categorised into aesthetic appreciation, emotional impact, conceptual understanding, and environmental consciousness (Bueno et al., 2020).

4.4.1. Aesthetic Appreciation

Affirmative Responses:

Admiration of Craftsmanship: Some audiences express admiration for the skill and creativity involved in transforming waste materials into beautiful, intricate sculptures. Comments highlighted the textures, forms, and overall visual appeal of the artworks.

Response 1:

> *"The delicate textures and organic shapes are stunning. It's incredible that these pieces were once considered waste."*

Appreciation of Innovation: Some viewers praised the innovative use of materials, seeing the sculptures as a fresh and creative approach to traditional ceramics.

Response 2:

> *"This is a brilliant way to push the boundaries of what ceramic art can be. It's both modern and deeply connected to the earth."*

Constructive Criticism:

Suggestions for Enhancement: Some audience suggested ways to enhance the aesthetic appeal, such as incorporating more vibrant colors or combining clay residues with other materials.

Response 3:

> *"The natural tones are beautiful, but it would be interesting to see how a splash of colour might change the dynamics of the piece."*

4.4.2. Emotional Impact

Affirmative Responses:

Connection to Nature: Some audiences expressed a deep emotional connection to the sculptures, especially if they evoke natural forms or landscapes. This process elicits feelings of nostalgia, peace, or reverence for nature.

Response 4:

> *"These sculptures remind me of the landscapes of my childhood—there's something very peaceful and grounding about them."*

Sense of Ephemerality: The transient nature of the sculptures evokes reflections on the passage of time, the impermanence of life, or the beauty of decay.

Response 5:

> *"Knowing these pieces won't last forever makes them even more precious. It's a poignant reminder of life's fleeting beauty."*

Mixed Responses:

Melancholy or Loss: Some viewers might feel a sense of melancholy or sadness at the idea that the sculptures will eventually degrade, leading to reflections on loss and impermanence.

Response 6:

> *"There's a sadness in knowing these sculptures will eventually fade away, but perhaps that's what makes them so powerful."*

4.4.3. Conceptual Understanding

Affirmative Responses:

Grasp of Environmental Themes: Some audiences express a clear understanding and appreciation of the environmental messages embedded in the artworks, recognizing the importance of sustainability and waste reduction.

Response 7:

> *"I love how these sculptures make you think about waste in a new way. It's a brilliant commentary on sustainability and the art of reuse."*

Interpretations of Symbolism: Viewers offer interpretations of the symbolic meanings in the sculptures, relating them to broader themes such as regeneration, the cycle of life, or the intersection of nature and human creativity.

Response 8:

> *"The way these forms blend with the natural environment speaks to the interconnectedness of all things. It's a beautiful metaphor for life."*

Challenges in Understanding:

Complexity of Concepts: Some audience find the concepts behind the artworks challenging to grasp, especially if they are unfamiliar with the themes of sustainability or ephemeral art.

Response 9:

> *"I'm not sure I fully understand the idea behind using residues—why not just use fresh clay?"*

4.4.4. Environmental Consciousness

Affirmative Responses:

Increased Awareness: The artworks inspire viewers to reflect on their own environmental impact and consider how they can incorporate sustainable practices into their lives.

Response 10:

> *"Seeing how something as simple as clay residues can be turned into art makes me think about how much we waste every day. I'm inspired to be more mindful."*

Support for Sustainable Art: Some audience express strong support for the use of sustainable materials in art, seeing it as a necessary evolution in artistic practice.

Response 11:

> *"This kind of art is exactly what we need today—beautiful, thought-provoking, and good for the planet."*

Skepticism or Critique:

Practicality Concerns: There was skepticism about the practicality of using residues for art on a larger scale, with some questioning whether this approach can truly make a significant environmental impact.

Response 12:

> *"It's a great idea, but I wonder if this can really make a difference in the long run. What about the energy used in other parts of the process?"*

5. Discussion

The use of clay residues as the primary material for creating ephemeral sculptures highlighted the potential for reimagining waste as a resource in artistic practice. This approach aligns with Material Engagement Theory (MET), which emphasizes the reciprocal relationship between materials and creative processes (Malafouris, 2013; 2014; 2019). The study demonstrated that clay residues, often viewed as mere by-products, were transformed into meaningful and aesthetically compelling artworks. This transformation challenges traditional notions of material hierarchy in the arts, where new or 'pure' materials are often favored over residues or waste. The study not only reduces waste but also opens up new avenues for artistic expression by incorporating these residues into art (Asamoah et al., 2022). The ephemeral nature of the sculptures added a layer of complexity to this innovation. These works were not meant to last indefinitely, which contrasted with the conventional aim of creating permanent art objects. Instead, their transient existence invited viewers to engage with the concept of impermanence, echoing natural cycles of growth, decay, and renewal. This approach challenges artists and audiences to reconsider the value of art beyond its physical permanence, fostering a deeper appreciation for the fleeting moments that art can capture (Reynolds, 2023).

Audience responses to the ephemeral sculptures were varied, reflecting diverse perspectives on aesthetics, emotional impact, and conceptual understanding. Many viewers appreciated the craftsmanship and innovation involved in using clay residues, with some expressing a strong emotional connection to the natural forms and textures that the sculptures evoked. This positive reception

highlighted the potential for such works to resonate with audiences on both an aesthetic and emotional level (Bueno et al., 2020). However, the ephemeral nature of the sculptures also elicited mixed emotions. While some viewers found beauty in the transience of the works, others experienced a sense of melancholy or loss, stressing the complex emotional responses that ephemeral art motivated (Pharr, 2024). This range of reactions emphasizes the importance of considering audience perceptions in the creation of such works, as the emotional and conceptual impact varied widely depending on individual interpretations. The conceptual understanding of the artworks also varied. While many audience members grasped the environmental themes and appreciated the symbolic use of residues, others found the concepts challenging, particularly if they were unfamiliar with sustainable art practices (Jean, 2019). This suggested a need for more educational components in exhibitions to help bridge the gap between the artist's intentions and the audience's interpretations, ensuring that the environmental message is communicated effectively.

One of the central aims of this study was to explore how artistic practices contribute to sustainability by repurposing waste materials. The use of clay residues in the sculptures served as a practical example of how art addresses environmental concerns, transforming waste into beauty and inciting reflection on consumption and wastefulness (Asamoah et al., 2022). This aligns with broader trends in eco-art and sustainable art practices, where artists are increasingly using their work to comment on environmental issues and promote sustainable living (Kagan, 2011). However, the study also highlighted some challenges in achieving true sustainability in art. For instance, while the use of residues reduces waste, other aspects of the artistic process, such as the energy required for firing clay, still have environmental impacts. This raises important questions about the balance between artistic innovation and environmental responsibility. The study revealed that while the use of residues is a step in the right direction, a holistic approach to sustainability in art considers all stages of the creative process, from material sourcing to final production (Noce et al., 2021).

6. Implications for Future Artistic Practices

The findings of this study have several implications for future artistic practices, particularly in the context of sustainable art. Firstly, the success of using clay residues as a material suggests that other forms of industrial or post-consumer waste could be similarly repurposed, opening up new possibilities for creative expression (Sampah et al., 2024; Asamoah et al., 2022). Artists and educators are encouraged to explore these possibilities, fostering a culture of innovation that prioritizes sustainability.

Secondly, the varied audience responses highlight the need for artists to engage with their audiences more deeply, perhaps through interactive elements or educational programs that help explain the concepts behind the work (Jean, 2019). This could enhance the audience's appreciation of the environmental themes and ensure that the message of sustainability is effectively communicated.

Lastly, the ephemeral nature of the sculptures suggests a shift in how art is valued. Moving away from the traditional focus on permanence, artists can explore the beauty and significance of transient works, encouraging audiences to embrace the impermanence of life and the natural world (Reynolds, 2023; Pharr, 2024). This approach not only reflects ecological realities but also offers a powerful commentary on the temporality of human existence.

7. Conclusion

The study on repurposing clay residues into ephemeral ceramic sculptures has provided significant insights into the intersection of sustainability, artistic innovation, and audience engagement within the realm of contemporary art. By transforming what is often regarded as waste material into meaningful and aesthetically compelling artworks, this research challenges conventional notions of material value and permanence in art. The ephemeral nature of the sculptures highlights the beauty and significance of impermanence, aligning with natural cycles and inviting deeper reflections on environmental stewardship. Key findings from the study highlight the potential of sustainable art practices to promote both creative expression and environmental consciousness. The use of clay residues not only reduces waste but also opens up new avenues for artistic exploration, where the material itself plays a critical role in shaping the narrative and emotional impact of the work. This approach is particularly relevant in the context of Material Engagement Theory (MET), which emphasizes the dynamic relationship between materials and the creative process, demonstrating how materials can actively contribute to the meaning and reception of art.

Audience responses, while varied, generally reflected a strong appreciation for the craftsmanship and innovation involved in the creation of the sculptures. The artworks elicited a wide range of emotional and intellectual responses, from admiration for their aesthetic qualities to reflections on the broader themes of sustainability and the ephemeral nature of life. However, the study also revealed challenges in communicating complex environmental concepts to a diverse audience, suggesting the need for more educational outreach and interpretive support in future exhibitions.

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