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PLASTIC WASTE AND ITS ARTISTIC CONTEXT

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ABSTRACT

The prevalence use and handling of plastics have become a global menace to the environment. This menace has even led to a national discourse on banning plastics in Ghana. The plastic waste situation seems to be an oblivious less concerned by some Ghanaian sculptors, engineers and scientists on its artistic exploration and contribution to the quota of environmental sanitation in Ghana. However, having identified the artistic qualities of plastics, this article seeks to transform plastic waste into art by exploring and analysing non-biodegradable polyethylene as a viable and unconventional material for sculpture. The focus of this studio-based research employed the Praxis with arts-based recycling approach as technique and procedures to create a bust from plastic waste as a means of establishing its viability as an unconventional material for sculpture. It was established from the outcome of the research that plastics as non-biodegradable material should not be seen as an environmental menace, but a viable and unconventional material for sculptors and other professionals like engineers and scientists beyond Ghana must also expand on this research further.

1. INTRODUCTION

Plastics have benefited the world in various ways, and Ghana has become a beneficiary of the commercial use of plastics. Historically, biodegradable materials such as leaves were used to pack food in Ghana. However, the advent of technology introduced plastics for packaging and transporting goods like food from the market to homes. Plastic's importance as a non-biodegradable material has inspired innovation in recycling and makes life better, healthier and safer every day. Recycling innovation of plastics comes in various forms of making cell phones cases, bicycle helmets, child safety seats, airbags in automobiles, televisions, computers and other electronic equipment that makes modern life possible (Clutz, 2018).

Plastic packaging helps to keep food healthy and fresh. It has provided sustainable design and construction in houses, buildings and infrastructure such as bridges. Plastics are more efficacious in recycling. Polyethylene or poly (methylene) is the most common type of plastic seen. It is mainly used in packaging (plastic bags, plastic films, geo-membranes and containers, including bottles). A plastic bag or poly bag as popularly called in Ghana is a type of container made of thin, flexible, plastic film used as packaging for containing and transporting goods such as foods, powders, ice, magazines, chemicals and waste (Wikipedia contributors, 2020).

In Ghana, the plastic bag is one of the most widely used non-biodegradable materials, but at present, improper handling of plastic bags has caused more harm than good. Plastic bags adversely affect the environment by posing a threat and hazards for its inhabitants as waste. Greentumble (2018) hints that plastic waste affects all types of biomes and organisms. These consequences are manifested throughout the world and constitute a multinational global problem that must be addressed. Plastic bags continuously harm the natural environment from the beginning to the end of its lifecycle. Plastic shopping bags also account for a significant amount of plastic pollution on land. Plastic bags are easily windblown and transported over long distances. These plastics are mainly caught in trees or storm sewers. Improper handling of plastic bags is found in storm sewers, offshore or contributes to pollution. Blocked storm sewers can lead to flooding during heavy rains and create large areas of standing water, which are breeding grounds for disease-bearing insects such as mosquitoes.

Greentumble continued to stress that at landfill sites, plastics use a lot of space and can take 400 years to break down. This enormous period of biodegradation is causing more and more plastic bags to accumulate in our landfill sites. There is plastic pollution in the ocean and in our rivers as well. One of the biomes that is increasingly impacted by plastic waste is the ocean. Every year, about 13 million tons of plastic are thrown into the ocean. Certain plastics release chemicals into the water causing cancer and other health problems, but the most common problem is the consumption of plastic by animals. Fish, turtles and seabirds

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are the populations most affected by plastic debris. Almost 100 million marine animals per year die directly from the consumption of plastic waste. These animals often eat plastic that is not digestible in their bodies. It blocks their digestive tract, causing them to die. Even plants are not protected from plastic waste. When plastic decomposes in the soil, it releases harmful chemicals, such as bisphenol A (BPA), which can harm the natural microorganisms on which plants depend for their survival (Greentumble, 2018).

Musah (2019) stresses that plastic has been used for commercial and household purposes. Large quantities of plastic waste in Ghana appeared to lack the economic environment for recycling and the artistic use of art. This has made an enormous contribution to environmental degradation and pollution of the environment. As a nation, the mismanagement of plastic waste has become very critical and therefore needs to be addressed.

Ministry of Health, Ghana (2014) confirms that Ghana's cholera epidemic reached a record 17,000 cases with 150 deaths. The last time Ghana experienced such an alarming number of cases of cholera was in 1982. Figure 1 shows the heavy rains after exposing the dirt of the plastics which had engulfed the capital. Plastic bags can get stuck on plants, depriving them of the nutrients they need. Delicate natural cycles that equilibrate ecosystems are threatened. Other countries are attempting to prohibit the use of plastics because of their negative impact. Countries such as Rwanda, New Zealand, China, Israel, South Africa, the Netherlands, Morocco, Kenya, Mauritania, Sri Lanka and even Ghana are attempting to ban the production and importation of plastics.

Plastic waste in Ghana is mainly found in landfill sites, beaches, streets, sewers, households and in all parts of the environment. Environmental concerns about plastic waste have become less of a concern for some Ghanaian sculptors, engineers and scientists. This requires rethinking, handling and controlling plastic waste and seeing how this waste could also be artistically analyzed to serve a beautiful purpose in the environment. In line with Musah (2019), Greentumble (2018) and Ministry of Health, Ghana (2014), this global menace of plastic waste, as shown in Figure 1 and 2, has resulted in environmental challenges where, on the other hand, these waste materials could widen the scope of sculpture in terms new approaches to materials. Consequently, the article aims to transform plastic waste into art by exploring and analyzing non-biodegradable polyethylene as a viable and unconventional material for sculpture.

1.1 Plastic as a non-biodegradable material for art

The idea of plastic as a non-biodegradable material for art suggests that the plastic material would not deteriorate over time. Thomlinson (2019) is of the view that there are more sustainable plastic alternatives that exist; but they cannot be a sustainable solution without the infrastructure required to manufacture, collect and recycle them on a large scale. Mustalish (2004) adds that the development of plastics from the middle of the 19th century to the present has dramatically changed the materials of the physical world. Plastic has become a general term for synthetic materials which, as the name suggests, can be folded, molded or formed in any shape, be it rigid or flexible. In the 19th century, the world of synthetic chemistry started to expand, giving rise to new technologies in the chemical industry, dyeing, paper and textiles.

Visual-Arts-Cork (2019, para.1) describes plastic art as the term is derived from the word "plasticize", meaning to “mould". This describes any art form which involves modeling or moulding in three dimensions”. Based on the assertions of Thomlinson (2019), Mustalish (2004) and Visual-Arts-cork (2019), it is believed that non-biodegradable plastics can be used as a durable, non-conventional material for the artist.

1.2 Some plastics artists

1.2.1 Serge Attukwei Clottey

Clottey is a Ghanaian multimedia artist who practices Afrogallonism as a concept he has worked with for approximately 17 years. He uses yellow plastic gallon containers to investigate migration and interactions between Ghana and the West. The containers were originally used to store cooking oil that was imported into Ghana, and once discarded, they are typically transformed into plastic art. Plastic waste is problematic because Ghana does not have many recycling facilities. Using gallons of plastic as an artistic material, Clottey cuts, pierces and overlaps them for his sculptures. Plastic gallons migrate through his practice

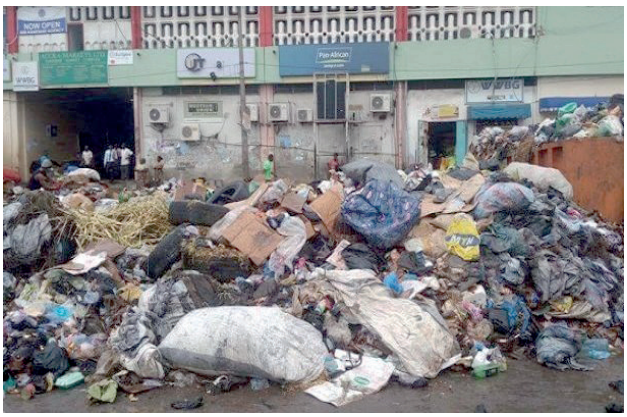

FIGURE 1: Accra engulfed with plastic waste (Source: Boadu, 2017).

FIGURE 2: Environmental challenges with plastic waste (Source: Field Study, 2021).

FIGURE 3: Gallon works of Serge Attukwei Clottey (Source: Geyser, 2020).

FIGURE 4: Serge Attukwei Clottey with gallon mask (Source: Geyser, 2020).

of reselling them to the West as artwork (Brito, 2018). This statement from Brito (2018) highlights the artist's techniques as an installation in reusing discarded materials such as gallons to the community. Figures 3 and 4 show a few artworks by Serge Attukwei Clottey.

1.2.2 Mbongeni Buthelezi

Buthelezi was born in 1966 in Johannesburg, South Africa. Mbongeni Buthelezi is an artist who became renowned for his plastic "painting". He studied at the African Institute of Art in Johannesburg from 1986 to 1992 and at the University of Witwatersrand from 1997 to 1998. The material Mbongeni Buthelezi uses for his "paints" is always plastic waste. He cuts it into small pieces and glues them to the canvas, creating surfaces and structures in subtle and changing colours and tones. The use of such material shows Buthelezi's awareness of environmental problems and the physical decay of the townships as well as the references to general social and political impoverishment and flaw of opportunities and unconventional that he observes in South Africa (Artnet, 2020).

In view of this, the artist has developed a technique of painting with collage form of heating plastics on a canvas. The artist has been working on developing a unique style of art making by using discarded plastic of a certain quality in melting process. He paints in impastos solid forms burnt with a heat gun. His unique paintings are often larger than life. He is able to work realistically and abstractly with the technique being extremely detailed as shown in the Figures 5, 6, 7 and 8.

1.2.3 Angela Haseltine Pozzi

Pozzi is also a female sculptor who works with plastics. She was born in Portland, Oregon to a family of artists. Pozzi's evolution as an artist shifted when she noticed immense amounts of plastic pollution on pristine southern Oregon beaches. As she learned more about ocean pollution from plastics and marine debris, she became motivated to do something about it. Thus, the Washed Ashore Project was born. Pozzi decided to enlist the help of hundreds of local volunteers to clean up the beaches, and use all the debris to construct massive sculptures of the sea animals most affected by the pollution. Pozzi is intrigued with textures, patterns, and colours in the world around her. She sees the designs of sea creatures in familiar human made objects, and creates additional elements out of anything that works. Her childhood of wading in the Pacific Ocean and digging in the dirt of Puget Sound has greatly influenced her work. Being raised by relatives who were artists and naturalists also gave Pozzi a sense of direction. These sculptures now tour as the "Washed Ashore Project" traveling exhibit, educating and inspiring countless people from diverse backgrounds to take action in their own lives to prevent contributing to this global problem. She works as a Lead Artist, designing and creating a multitude of marine creatures from continuous tonnes of marine debris with the aim of having a global impact. As the leader of a team of dedicated employees and hundreds of volunteers, Pozzi has vowed that this effort is her calling and "until we run out of plastic on the beach, we will keep doing our work" (Exploratorium, 2020).

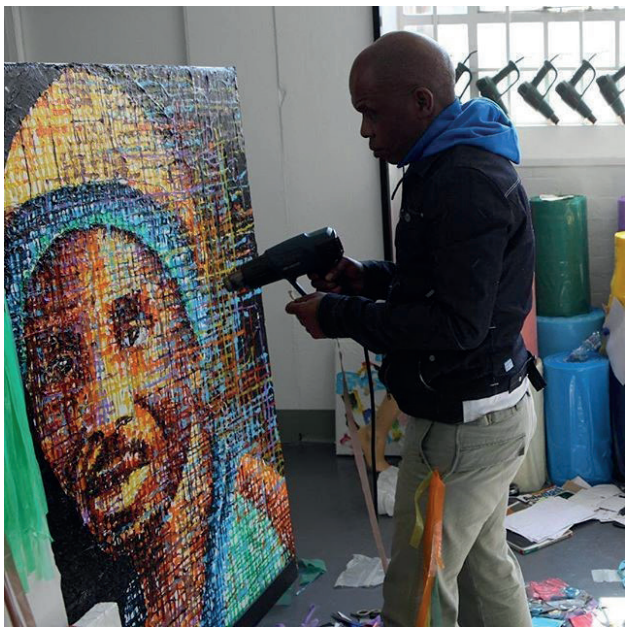

FIGURE 5: Artist working (Source: Pinterest, 2019).

FIGURE 6: Mbongeni Buthelezi and his works (Source: Pinterest, 2019).

FIGURE 7: Work by Mbongeni Buthelezi (Source: Pinterest, 2019).

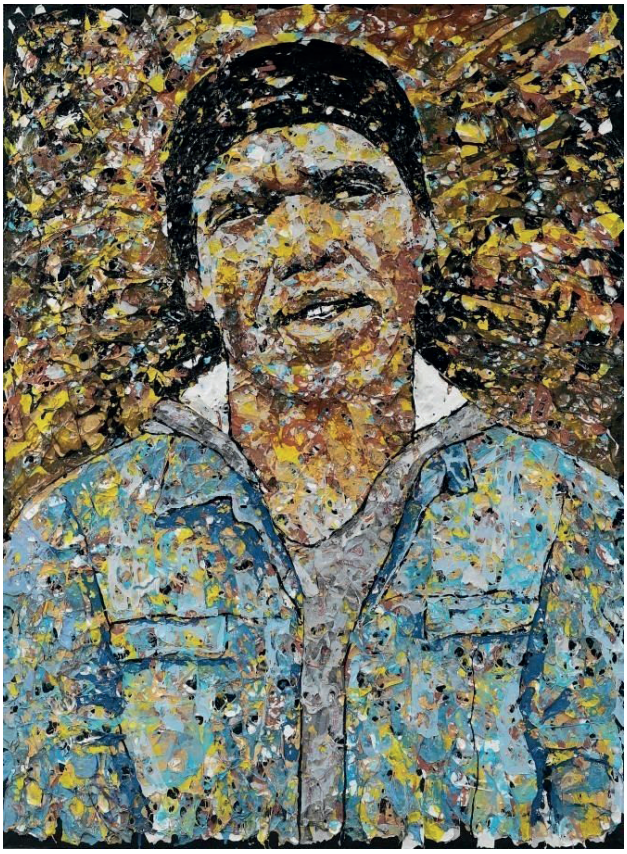

FIGURE 8: Self-portrait by artist Mbongeni Buthelezi (Source: Alchetron, 2019).

Pozzi's style and technique of work are ascribed to her construction of textures, patterns and coloured plastics for massive sculptures as shown in Figures 9 and 10.

2. MATERIALS AND METHODS

This studio-based research focused on Praxis with arts-based recycling approach as technique and procedures employed for the execution of the sculptural work. Marshall (2010, p.1) points out that, "studio-based research is rich with possibilities for contributing to the body of knowledge concerning creative processes". This research design focused on the connections between the Praxis and the assumption that the plastic wastes which contribute to environmental challenges by polluting the environment could be also transformed into sculptural works by artistically beautifying the environment. The purpose of the interpretive analysis was to explain the techniques and procedures for sculpting busts from plastic waste.

2.1 Theory and technique

For the practitioners to produce a bust within the studio or artistic context, a theoretical framework has to be established through several ideas and processes regarding the materials and methods for production of the artwork. The arts-based recycling approach as technique and procedures was used to create a piece of sculpture with

FIGURE 9: Washed ashore (Source: Muldoon, 2010).

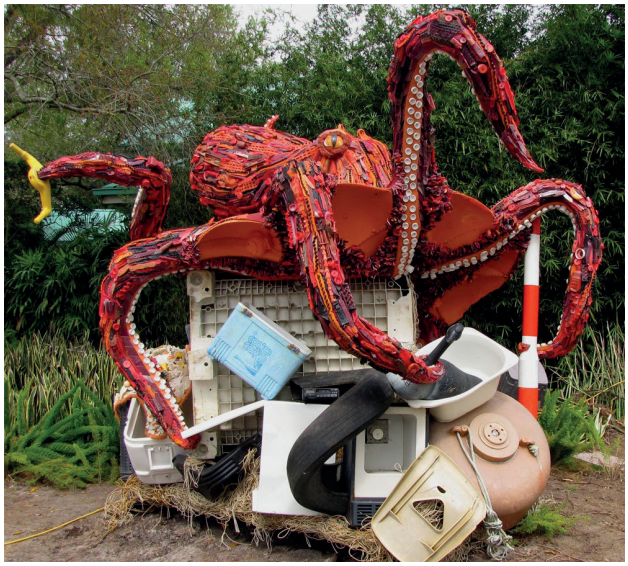

FIGURE 10: Washed ashore (Source: Washed ashore, 2020).

plastic waste as a means of establishing its viability as an unconventional material for sculpture. With this approach, a greater portion of the plastic wastes that frequently ends up in landfill, dumpsites can be sourced, retrieved efficiently for free or at low cost for production of art. The use of modelling and gluing techniques in the production of the bust served as the basis for the research. In line with the statement of Ward (2008), using techniques to transform materials into objects that have the ability to stir emotions and defy the intellect with created art. This basic technique was used to recycle ideas and styles so that the bust could be created.

2.2 Tools, materials and equipment

This section provided a detailed account on tools, materials and equipment for producing the bust that practically included hacksaw, hammer, blade, scissors, buttons, toothbrushes, tape measure, plier, drilling and arc welding machines. The tools and equipment were tools used for the realization of the bust. Materials, however, were non-biodegradable substances used for production processes. Kuhtz (2017) argues that any material that can be three-dimensional can be sculpted. Some materials, due to their structural and aesthetic properties and availability, have been shown to be particularly suitable. The following materials were used for execution of the work; polythene bags (non-biodegradable), wooden board (Red wood), iron metal rod, galvanized round metal pipe, chicken wire mesh, foam, buttons and adhesive (Contact glue).

2.3 Quantities of materials and analysis of the costs for the bust production

Prior to the execution of the work, a detailed report on the quantities of materials and the cost analysis is provided for the production of the bust. This helped the research to identify the specific and exact materials available as set out in Table 1 for the bust production.

2.4 Procedures about the production processes for the bust

In this studio practice, the production processes conducted in the production of the bust were practically oriented and intellectual commitment. In the production of sculptures, the exploration of different materials, notably

TABLE 1: Quantities of materials and analysis of the costs.

S/N	Item	Description	Total Quantity	Unit Price	Total Price
1.	Plastic wastes (Polyethylene/Polythene bags - all kinds were collected from the environment)	Large = 16 pcs Small = 20 pcs	36 pcs	*	*
2.	Iron rods	7.5 mm (3/8) 12 mm	2 pieces 2 pieces	8.00 x 2 26.00 x 2	¢16.00 ¢52.00
3.	Galvanized metal pipe	2" round metal pipe	1 bar	85.00 x 1	¢85.00
4.	Wooden board	hard wood (Red wood)	1 board	70.00 x 1	¢70.00
5.	Chicken wire mesh	Stainless steel hexagonal mesh	1 (full) roll	175.00 x 1	¢175.00
6.	Foam	Polyurethane foam – low density	2" sheet	110.00 x 1	¢110.00
7.	Buttons	Plastic buttons (Fancy)	5 pieces	1.00 x 5	¢5.00
8.	Adhesives (Contact glue)	Type 99-glue	6 cans (Small)	18.00 x 6	¢108.00
	Grand total				¢621.00

** pcs= Pieces, " = Inches, x = Multiply, mm = Millimetres, ¢ = Ghana currency (cedi sign)*

unconventional materials such as plastic waste, is accompanied by new approaches and new styles. This gave practitioners the chance to explore polyethylene as a material for the bust. In addition, plastic waste as the main material of the research was stretched to test its flexibility, strength, toughness and retention properties (Rosato et al., 1991). This allowed the study to use plastic waste of various kinds for sculpture work. In this production process, practitioners effectively used five procedural steps in a sequential approach to achieve the goals of studio research.

2.4.1 Procedure 1: Idea development

The development of ideas was the planning stage when practitioners redefined the concept of production of Prof. Victor Kweku Bondzie Micah (1974-), who is a practising sculptor and the Pro Vice Chancellor of Takoradi Technical University (2018-). Micah was born on 9th October 1974 in Winneba, Ghana and married with three (3) children. He is also the "Okyeame of Ekumfi Akosti Anona Okusubenstir Ebusua". The motivation of this research was based on Micah's practical skills in the fraternity of art and his higher heights in academia. The development of ideas took the form of images, as illustrated in Figures 11 to 14. These images were taken from various angles to produce the work.

2.4.2 Procedure 2: Securing materials for the bust

The following materials (polythene bags, contact glue, round metal pole, red wood, foam, buttons, wire mesh, and metal rod) were acquired for the execution of the work. Figure 15 shows a redwood panel. This redwood panel

FIGURES 11-14: Side view, back view, three-quarter view, front view.

FIGURE 15: Wooden board (Redwood) with galvanized round metal pipe.

FIGURE 16: Chicken wire mesh.

FIGURE 17: Iron metal rod.

FIGURE 18: Polythene bags.

FIGURE 19: Foam cuts into stripes.

FIGURE 20: Contact glue (type 99-glue).

was used as a support for the base of the work. Figure 16 shows a chicken wire mesh used to strengthen the work. It was used as a substrate on the armature for modelling and gluing of the polyethylene bag. As shown in Figure 17, Iron metal rod made of three-quarter and half-inched sizes were used for the work. Figure 18 also shows the acquisition of various types of polyethylene bags as the main material of the artwork. Polyethylene bags collected from the waste were cleaned and used for artwork. Figures 19 and 20 show the foam and contact glue of the structure.

2.4.3 Procedure 3: Producing the armature for the bust

The angle grinder with sandpaper was used to polish the surface of the wooden base for neatness and precision of the wooden base. A hole was drilled in the middle of the wooden base. The hole served as a passage and support for the round metallic pipe to be placed firmly into the wooden base. This helped to build the armature. The armature with iron metal rods and round galvanized metallic round pipe were welded together to fix the head to the shoulder level of the artwork (Figures 21-24).

2.4.4 Procedure 4: Constructing the bust with Polyethylene bags

At this point, the wrapping of chicken wire mesh on the armature as shown in Figures 25 to 28 was done. Tools like scissors and plier were used to cut the chicken wire mesh and wrap it around the armature. After wrapping process, the foam (flat foam) was cut into pieces, then applied onto the armature bit by bit to achieve the shape of the head. After establishing the armature with the chicken wire mesh, polyethylene bags were cut and wrapped

FIGURE 21: Sanding the wooden base.

FIGURE 22: Drilling a hole on the wooden base.

FIGURE 23: Welding the metal rods together.

FIGURE 24: Completion of the armature.

around the armature using contact glue. Foam and polyethylene bags were used to minimize the heaviness of the work. The modelling technique was used to get a round-shaped on the head and box-shaped of the bust. After obtaining the shape of the head with foam, polyethylene bags were sliced with scissors. It was then folded over the foam. Time was taken to ensure that the modelling of the face and suit on the bust with polythene bags was carefully done to achieve resemblance of the Pro Vice Chancellor (Prof. Victor K. B. Micah). The modelling technique was used throughout this step to obtain the resemblance indicated in Figures 25 to 48.

FIGURE 25: Cutting the wire mesh.

FIGURE 26: Wrapping the wire mesh around the armature.

FIGURE 27: Wrapping process of the wire mesh.

FIGURE 28: Completion of wrapping process.

FIGURE 29: Polythene bag and blade.

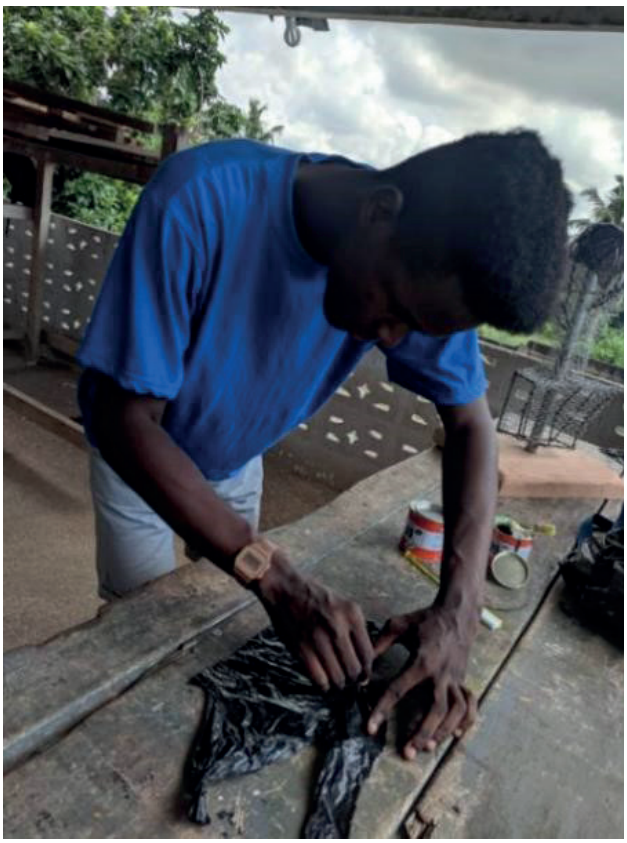

FIGURE 30: Cutting the polythene bag into pieces.

FIGURE 31: Applying the glue on the polythene bag.

FIGURE 32: Wrapping the polythene bag around the armature.

FIGURE 33: Wrapping process with polythene bag.

FIGURE 34: Completion of the wrapping process.

FIGURE 35: Building the head with foam.

FIGURE 36: Covering the foam with polythene bag.

FIGURE 37: Completion of the foam process.

FIGURE 38: Covering the foam with polythene bag.

FIGURE 39: Building the suit with foam.

FIGURE 40: Completion of the wrapping process with polythene bag.

FIGURE 41: Folding of polythene bag.

FIGURE 42: Modelling with polythene bag.

FIGURE 43: Modelling process (a).

FIGURE 44: Modelling process (b).

FIGURE 45: Modelling process (c).

FIGURE 46: Modelling process (d).

FIGURE 47: Modelling process (e).

FIGURE 48: Modelling process (f).

2.4.5 Procedure 5: Finishing the bust

Adding the final touch to the constructed work, colourful polyethylene bags were cut into square pieces with a blade. The square pieces of polyethylene bags were glued to the face to create the skin tones. Plastic buttons were attached to the work jacket to increase realism. The final steps are shown in Figures 49-57. The resemblance was assessed by juxtaposing the development of the image idea (front view) taken with the final work done in figure 57.

3. CONCLUSIONS

This studio-based research focused on transforming

FIGURE 49: Coloured polythene bags and blade.

FIGURE 50: Cutting of coloured polythene bags into square pieces.

FIGURE 51: Creating the skin tones.

FIGURE 52: Skin tones created.

FIGURE 53: Fixing the buttons on the suit.

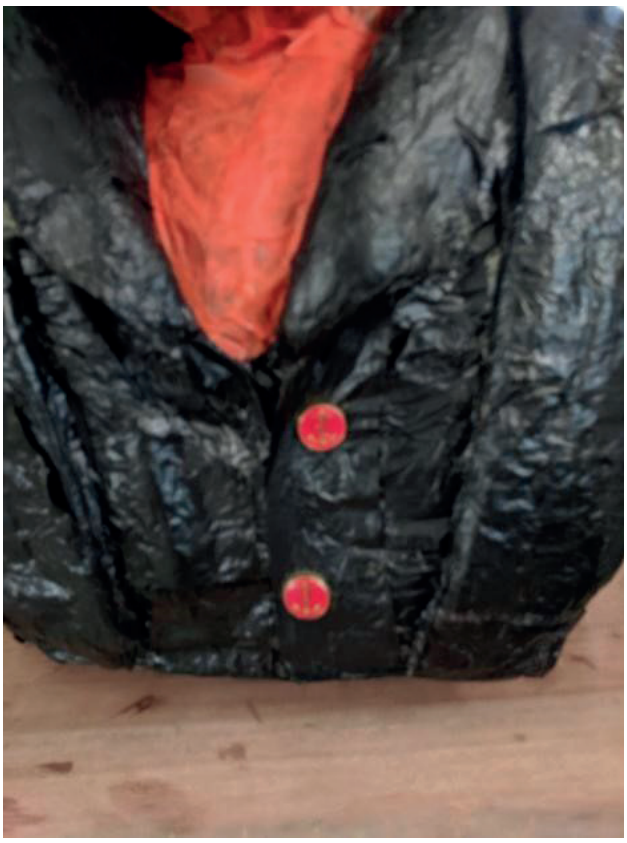

FIGURE 54: The fixed buttons.

FIGURE 55: Finishing process.

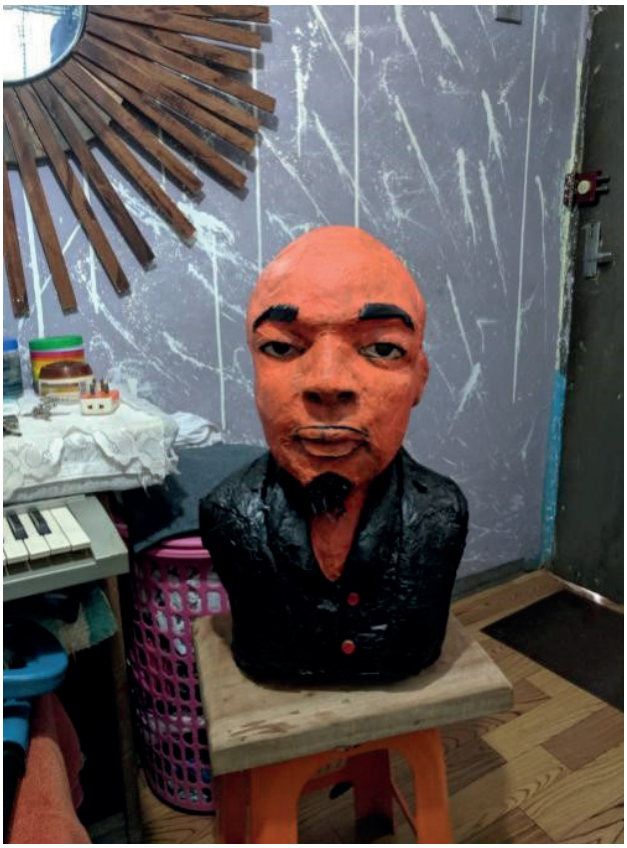

FIGURE 56: Completion of the bust.

FIGURE 57: The finished work.

plastic waste (polyethylene bags) into a bust of Prof. Victor Kweku Bondzie Micah (Professional sculptor and Pro Vice Chancellor of Takoradi Technical University- (2018-). The research was premised on plastic waste which threatened and saddled the environmental situations in Ghana, thereby exploring and analyzing the artistic context of plastic waste as having the potentials to serve as sustainable and alternative raw materials for the artist.

Through this exploration on plastic wastes, it was established from the outcome of the research that the plastic sculpture (bust) produced from polythene bags has a great benefit of building a better Ghana and its sustainable development plan on environmental issues. It is therefore recommended that plastic waste as non-biodegradable material should not be seen as an environmental menace, but a viable and unconventional material for sculptors and other professionals like engineers and scientists beyond Ghana must also expand on this research further. It is also recommended that the policy makers on environmental development, such as Environmental Protection Agencies and other responsible entities in Ghana and beyond should develop collective responsibilities of using plastic waste. This helps as a potential and alternative purposes whereby giving artists, engineers, and scientists the platform to ensure that environmental issues with plastic waste can be valued by using them more responsible for the production of plastic artworks and other plastic products.

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