

# Investigating the Documentation and Conservation Process of Outdoor Artworks in Ghana

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## Abstract

The purpose of this study was to investigate the documentation and conservation process of outdoor artworks in Ghana citing Takoradi Technical University's main campus as a case study. A total of 22 outdoor sculptures dating from 2002 to 2020 was catalogued in the various parts of the institution including the artworks by sculpture students and lecturers. A comprehensive data was created for each sculpture with information on the location, artist, materials, historical and technical notes, state of conservation. Direct observation and face-to-face interviews were conducted with sculpture lecturers, studio technicians, past and present art students who were purposively sampled for the study. Through the interpretive analysis, the study revealed that with the twenty-two (22) outdoor sculptures, none of them had been conserved and restored ever since they were created for artistic purposes. The artworks were made from wood, metals, concrete cement, tyres and sachet plastic rubbers. The cataloguing of the outdoor artworks serves as a reference of representation, inspirational intuition, aesthetics and symbolic importance for the institution.

## Keywords

Contemporary Outdoor Artworks, Conservation, Catalogue, Restoration, Takoradi Technical University

## 1. Introduction

Takoradi Technical University (TTU) has a passion for outdoor artworks as environmental beautification, yet its contemporary art heritage, particularly the outdoor artworks has rarely been investigated. In the past, artworks located in public spaces were celebrations or memory of the power of noble families, mer-

chants or politicians. Today, they are a form of urban ornamentation. Some contemporary artworks on TTU's main campus are visible whilst others are poorly visible with low potential that suffers from a lack of maintenance, vandalism, smoke, soot, vehicle emissions, advertising posters, signage and trees (**Figure 1**, **Figure 4**, **Figure 9**, **Figure 15** & **Figure 18**). These obstacles have left the outdoor artworks less appreciable because of the uncontrolled growth of weeds and vegetation.

The main features of contemporary sculpture include a great variety of shapes, techniques and expression of materials (Wharton, 2005). In the 20th century, artists began to be influenced by the innovations produced by industrial development, such as new materials and innovative application techniques. The percentage of contemporary outdoor artworks that are not well conserved is significant.

### 1.1. Statement of the Problem

In conservation, there is the need to consider the changes in materials and works. This practice is acceptable without distorting the artistic message and when and how the action should be performed and documented where cataloguing remains the key factor (Wharton, 2005). Boyd and Skalny (2007) share that the cataloguing of artworks should also be a priority for local public institutions by creating files containing detailed information such as materials, state of conservation, previous maintenance interventions. This statement is fundamental. It is appropriate for preventive and conservative monitoring of artworks and periodic maintenance. However, in TTU there is no such cataloguing of Artworks. The first attempt in this direction was by Boakye-Yiadom, Otoo and Faniyan (2016) for the thematic and aesthetic review of outdoor sculptures in TTU through photo documentation. The collaboration includes documenting and assessing the state of the works. The findings from their study suggested a lack of documentation and conservation on the outdoor sculptures in TTU. The situation showed no future for the sculptures that have a debilitating effect on the artistic culture of the University, Ghana and the world at large.

In 2004, the Government of Ghana came up with several initiatives to protect and conserve the Ghanaian heritage through the National art policy. Since the promulgation of the policy, no outdoor sculpture has been conserved and restored by the authorities (Center for National Culture, Ghana Art Council, MMDAs) responsible for the safekeeping of heritage. This attempt violates the 1999 ICOMOS principles (International Council on Monuments and Sites principle) (Australia ICOMOS, 2013). There is an urgent need to develop new comprehensive and up-to-date data on the identification, characterization and state of conservation of the artworks, eventually exploiting the econometric model, together with documentation of previous restorations if any (Cantisani et al., 2018).

### 1.2. Aim

The study sought to investigate the documentation and conservation process of

outdoor artworks in Ghana citing Takoradi Technical University's main campus (new-site) as a case study.

### 1.3. Objective

To study and evaluate the contemporary outdoor artworks from 2002 to 2020 on TTU's main campus.

## 2. Methods

The research was carried out using the qualitative research approach. The qualitative inquiry was appropriate because the study required the use of an ontological research philosophy that dealt with interpretivism or constructivism. The study adopted the subjective ontology approach with the nature of reality that reflects an interpretation by an individual about what constitutes a fact (Dudovskiy, 2021). This type of research paradigm informed the researchers' decision to focus on perceptions and consequent actions of an in-depth interview, observation, description and pictorial approach to collecting data (Ary, Jacobs, & Razavieh, 2002; Best, 2000). The study consisted of surveys of outdoor sculptures on the TTU's main campus. Each survey included the name of the artist, the year the sculpture was created, the dimensions and materials of the sculpture. Each survey includes a photograph of the artwork. The study participants were purposively selected by accruing data from studio technicians (5), art lecturers (5), past and present art students (5). Their responses constituted fifteen (15) study participants with descriptions and positions harmonised in the twenty-two (22) artworks (Given, 2008). Predominantly, the spotlight was placed on twenty-two (22) contemporary outdoor artworks used during data collection, namely the resilient, vigilance, forward ever backward never, companion, Sankofa, Nkyikyim, drummer, lovers, township dance, the chosen one, signage, tradition, knowledge, leaner, thinker, diligence, cenotaph, music, wise saying and emerging.

The interpretive data analysis was used to analyse the data from the study. The data analysis looked at the verbal or description accounts in words by respondents and put the direct observations into words as a form of description and supported with photographs of artworks (Elliott & Timulak, 2005). Each artwork was described with a visual investigation, historical research and the artist's intervention. The conversations were organized in a homogeneous scheme, following some Dutch reviewed models. This model enabled different problems to be characterized for each artist. The artists' point of view was crucial in terms of gaining knowledge of the materials and understanding the essence of the artwork. Each data for the artworks was drawn up by the relevant place and gave the author, title, creation date, subject, location, technical information, and any inscriptions. Also, the data comprised a brief description of the artwork, history and artistic notes on the author, notes on the University context, and a description of the state of conservation. The deterioration of materials was described per the 1999 ICOMOS document. The file also contains photos indicating the

location of the artwork. Each file is organized as follows:

**Description of the Artwork**

- Title
- Creation date
- Author
- Subject
- Dimension
- Materials
- Location map
- Date of placement at current location
- Inscription (if any)
- Foundry/factory
- Customer
- Owner/supervisor

**Information on the State of Conservation**

- Structural conditions
- Surface appearance/econometric model
- Presence of treatment/conservation conditions
- Presence of water
- Vandalism

**Additional Information**

- Brief description of the artwork
- Historical and artistic notes on the artist
- Notes on urban context
- Previous restoration treatment
- Information provided by the artists (material, execution technique, meaning/idea behind the artwork)

### 3. Results and Discussion

#### 3.1. Contemporary Outdoor Artworks on TTU's Main Campus

A sculptural work of art displayed outdoors can transform a space. Unfortunately, constant exposure to the elements and potential damage from living creatures (especially humans) and lack of cataloguing makes outdoor artworks far more challenging to preserve than a work displayed indoors. It is important to recognize that a sculpture displayed outdoors needs regular inspections, maintenance and be catalogued to ensure its long-term preservation for the present generation yet unborn (Ford Conservation Center, 2017; Li et al., 2015). **Table 1** displays issues to consider: name of the artist, the year and the artwork was created, dimensions and materials of the sculpture, where the artwork is located, and any preservation or conservation needs for the artworks. Each survey includes a photograph of the artworks, the methods used in their production and some basic practices that can be carried out to maintain the contemporary outdoor artworks be in stable condition. Cataloguing contemporary outdoor

**Table 1.** Materials, year of location in its public space name of the author for outdoor contemporary sculptures and name of the sculpture in TTU.

S/N	Materials	Year	Author's Name	Name of the sculpture
1	Mild Steel and Iron Rods ( <b>Figures 1-8</b> )	Figures 1, 2: 2015 3: 2016 4: 2017 5, 6: 2016 7, 8: 2017	Students projects supervised by Frederick Boakye-Yiadom	Figures 1, 2: Resilient 3: Vigilance 4: Companion 5: The chosen one 6: Forward ever backward never 7: Sankofa 8: Nkyikyim
2	Concrete cement ( <b>Figures 9-19</b> )	Figures 9:2016, 10:2018, 11:2018, 12:2002, 13:2002, 14:2004 15:2017, 16:2004, 18:2008, 19:2005, 21:2005	All are students' projects except <b>Figure 9</b> , <b>Figure 11</b> and <b>Figure 12</b> by Evans Kwadwo Donkor; Victor K. B. Micah and Samuel Ebo Bentum respectively	Figures 9: Drummer 10: Township Dance 11: Signage 12: Tradition 13: Knowledge 14: Learner 15: Thinker 16: Diligence 17: Cenotaph 18: Music 19: Wise saying
3	Tyres ( <b>Figure 20</b> )	Figure 20: 2019	Students' Project	20: Lovers
4	Iron rods and Sachet Rubbers ( <b>Figure 21</b> )	Figure 21: 2016	Students' Project	21: Emerging
5	Metal and wood ( <b>Figure 22</b> )	Figure 22: 2018	Students projects supervised by Fredrick Boakye-Yiadom	22: Signage

artworks on TTU's main campus is one of such determinants which need to be studied properly. **Table 1** summarizes the materials used, including: the name of the sculpture, year of location in its public space and name of the author.

From **Table 1**, twenty-two (22) artworks were catalogued for the study. Eight (8) artworks were made of mild steel (**Figures 1-8**). Eleven (11) artworks were made of concrete cement (**Figures 9-19**). One (1) artwork was made of tyre (**Figure 20**) while one (1) artwork was made of iron rods and sachet rubbers (**Figure 21**). Lastly, one (1) artwork was made from metal and wood (**Figure 22**). The sequential figures in the description of the artworks are labelled according to the listed figures under the material in the table.

### 3.1.1. Description of the Artworks (Figure 1 and Figure 2)

Title: The resilient

Creation date: 2016

Author: Students' project

Subject: Irrepressible

Dimension: 154 cm × 132 cm × 68 cm; 189 cm × 148 cm × 97 cm

Materials: Mild Steel, iron rods, electrodes, and anti-rust paint

Location: Sculpture park at Faculty of Applied Art (FAAT), TTU

Date of placement at current location: 2016

Inscription (if any): None

Foundry/factory: TTU Sculpture Studio

Customer: TTU Sculpture Department

Owner/supervisor: Fredrick Boakye-Yiadom

**Information on the State of Conservation**

Structural conditions: Deterioration

Surface appearance: Break in joints and rust

Presence of treatment/conservation conditions: None

Presence of water: Yes

Vandalism: Yes, due to lack of care

Location: FAAT, TTU-Fore court/Car park

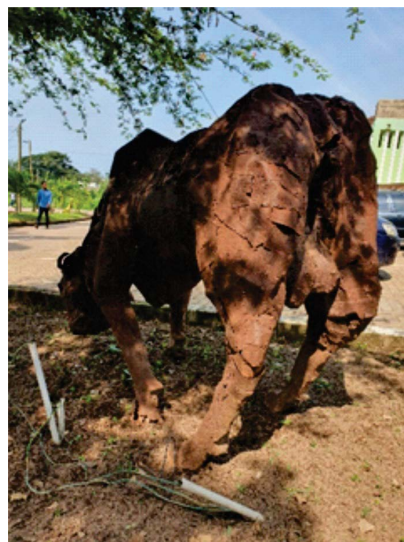
**Additional Information**

Brief description of the artwork: it is a metal sculpture in the round. The technique used in its production was arch welding and painted with anti-rust paint.

Historical and artistic notes on the artist: the sculpture was produced by students of the Department of Sculpture Technology.

Notes on Takoradi Technical University context: The University trains students on hands on programme to be able to fit into the job market. The programme sculpture addresses unemployment situation in the country which form part of the key vision and mission of the University.

Previous restoration treatment: No Restoration treatment except periodic clearing of weeds.



**Figure 1.** “Resilient” 2015, Mild steel, Iron rods, 154 cm × 132 cm × 68 cm.



**Figure 2.** “Resilient” 2015, Mild steel, Iron rods, 189 cm × 148 cm × 97 cm.

Information provided by the artists (material, execution technique, meaning/idea behind the artwork): No document on the sculpture by the artists.

### 3.1.2. Description of the Artworks (Figure 3 and Figure 4)

Title(s): Vigilance; Companion

Creation date: 2016; 2017

Author: Students’ project

Subject: Untitled

Dimension: 265 cm × 76 cm × 54 cm; 187 cm × 98 cm × 67 cm

Materials: Mild steel, Galvanize steel, iron rods, electrodes, and anti-rust paint

Location: Sculpture park at Faculty of Applied Art (FAAT), TTU

Date of placement at current location: 2016; 2017

Inscription (if any): None

Foundry/factory: TTU Sculpture Studio

Customer: TTU Sculpture Department

Owner/supervisor: Fredrick Boakye-Yiadom

#### **Information on the State of Conservation**

Structural conditions: Deterioration

Surface appearance: Rust

Presence of treatment/conservation conditions: None

Presence of water: Yes

Vandalism: No

Location: FAAT, TTU-Fore court/Car park.

#### **Additional Information**

Brief description of the artworks: They are in-the-round metal sculptures. The technique used was assemblage and construction with fabrication and arc welding methods.



**Figure 3.** “Vigilance” 2016, Mild steel, Iron rods, 265 cm × 76 cm × 54 cm.



**Figure 4.** “Companion” 2017, Mild steel, Iron rods, 187 cm × 98 cm × 67 cm.

### **3.1.3. Description of the Artworks (Figure 5 and Figure 6)**

Title(s): The chosen one; Forward Ever, Backward Never

Creation date: 2016; 2016

Author(s): Students’ project

Subject: Untitled

Dimension: 367 cm × 65 cm × 67 cm; 376 cm × 67 cm × 66 cm

Materials: Mild Steel, iron rods, electrodes, and anti-rust paint

Location: Sculpture park at Faculty of Applied Art (FAAT), TTU

Date of placement at current location: 2020

Inscription (if any): None

Foundry/factory: TTU Sculpture Studio

Customer: TTU Sculpture Department

Owner/supervisor: Fredrick Boakye-Yiadom

#### **Information on the State of Conservation**

Structural conditions: Mild deterioration



Surface appearance: Holes in the works due to excessive tacking using the arc welding technique

Presence of treatment/conservation conditions: Artworks were created in 2016. However, they were completed in 2020.

Presence of water: Yes

Vandalism: No

Location: FAAT, TTU-Fore court/Car park.

#### **Additional Information**

Brief description of the artworks: They are in-the-round metal sculptures. The technique used was assemblage and construction with fabrication and arc welding methods.



**Figure 5.** “The chosen one” 2016, Mild steel, Iron rods, 367 cm × 65 cm × 67 cm.



**Figure 6.** “Forward Ever, Backward-Never” 2016, Mild steel, Iron rods, 376 cm × 67 cm × 66 cm.

### 3.1.4. Description of the Artworks (Figure 7 and Figure 8)

Title(s): Sankofa; Nkyinkyim

Creation date: 2017

Author(s): Students' project

Subject: Abstraction I

Dimension: 138 cm × 99 cm × 67 cm; 140 cm × 97 cm × 60 cm

Materials: Mild Steel, iron rods, electrodes, and anti-rust paint

Location: Sculpture park at Faculty of Applied Art (FAAT), TTU

Date of placement at current location: 2017

Inscription (if any): None

Foundry/factory: TTU Sculpture Studio

Customer: TTU Sculpture Department

Owner/supervisor: Fredrick Boakye-Yiadom

#### Information on the State of Conservation

Structural conditions: Deterioration

Surface appearance: Surface ripping and rust

Presence of treatment/conservation conditions: None

Presence of water: Yes

Vandalism: No

Location: FAAT, TTU-Fore court/Car park.

#### Additional Information

Brief description of the artworks: works are in-the-round metal sculptures. The technique used was assemblage and construction with fabrication and arc welding methods.



**Figure 7.** “Sankofa” 2017, Mild steel, Iron rods, 138 cm × 99 cm × 67 cm.



**Figure 8.** “Nkyinkyim” 2017, Mild steel, Iron rods, 140 cm × 97 cm × 60 cm.

### 3.1.5. Description of the Artworks (Figure 9 and Figure 10)

Title(s): The drummer; Township Dance

Creation date: 2016; 2018

Author(s): Students’ project

Subject: Abstraction II

Dimension: 87 cm × 78 cm × 45 cm; 198 cm × 56 cm × 59 cm

Materials: Concrete cement

Location: Sculpture park at Faculty of Applied Art (FAAT), TTU

Date of placement at current location: 2016; 2018

Inscription (if any): None

Foundry/factory: TTU Sculpture Studio

Customer: TTU Sculpture Department

Owner/supervisor: Evans Kwadwo Donkor; Owusu-Ansah Ankrah

#### **Information on the State of Conservation**

Structural conditions: Surface molds, paint peel-offs, breakages at joints

Surface appearance: Break in joints and Surface discolouration

Presence of treatment/conservation conditions: None

Presence of water: Yes

Vandalism: Yes, due to lack of care

Location: FAAT, TTU-Fore court/Car park.

#### **Additional Information**

Brief description of the artworks: Works are in-the-round cement sculptures. The technique used was direct modelling with smooth and patchy surface finishes.



**Figure 9.** “The Drummer” 2016, Concrete cement, 87 cm × 78 cm × 45 cm.



**Figure 10.** “Township Dance” 2018, Concrete cement, 198 cm × 56 cm × 59 cm.

### **3.1.6. Description of the Artworks (Figure 11 and Figure 12)**

Title(s): The Signage; Tradition

Creation date: 2018; 2002

Author(s): Students’ project

Subject: Communication

Dimension: 126 cm × 98 cm × 90 cm; 132 cm × 99 cm

Materials: Concrete cement

Location: FAAT; TTU old library

Date of placement at current location: 2018; 2002

Inscription (if any): None

Foundry/factory: TTU Sculpture Studio

Customer: TTU Sculpture Department

Owner/supervisor: Victor Kweku Bondzie Micah; Samuel Ebo Bentum

**Information on the State of Conservation**

Structural conditions: Surface molds, paint peel-offs,

Surface appearance: Surface molds, paint peel-offs,

Presence of treatment/ conservation conditions: None

Presence of water: Yes

Vandalism: Yes, due to lack of care

Location: FAAT, TTU-Fore court/Car park.

**Additional Information**

Brief description of the artworks: Both works are relief and in-the-round cement sculptures. The technique used was direct modelling, construction with fountain finishes.



**Figure 11.** “The Signage” 2018, Concrete cement, 126 cm × 98 cm × 90 cm.



**Figure 12.** “Tradition” 2002, Concrete cement, 132 cm × 99 cm.

### 3.1.7. Description of the Artworks (Figure 13 and Figure 14)

Title(s): Knowledge; Learner

Creation date: 2006; 2005

Author(s): Students' project

Subject: Beautification

Dimension: 123 cm × 110 cm × 97 cm; 198 cm × 87 cm × 85 cm

Materials: Concrete cement

Location: Hospitality Block; New Oduro Block, TTU

Date of placement at current location: 2006; 2005

Inscription (if any): None

Foundry/factory: TTU Sculpture Studio

Customer: TTU Sculpture Department

Owner/supervisor: Owusu-Ansah Ankrah; Samuel Ebo Bentum

#### Information on the State of Conservation

Structural conditions: Surface molds, paint peel-offs, breakages at joints

Surface appearance: Break in joints and Surface discolouration

Presence of treatment/conservation conditions: **Figure 13** has been conserved and restored by Frederick Boakye-Yiadom.

Presence of water: Yes

Vandalism: Yes, due to lack of care

Location: FAAT, TTU-Fore court/Car park

#### Additional Information

Brief description of the artworks: works are in-the-round cement sculptures. The technique used was direct modelling, casting and construction with lighting finishes.



**Figure 13.** "Knowledge" 2006, Concrete cement, 123 cm × 110 cm × 97 cm.



**Figure 14.** “Learner” 2005, Concrete cement, 198 cm × 87 cm × 85 cm.

### **3.1.8. Description of the Artworks (Figure 15 and Figure 16)**

Title(s): Thinker; Diligence

Creation date: 2017; 2004

Author(s): Students’ project

Subject: Untitled

Dimension: 198 cm × 165 cm × 61 cm; 123 cm × 65 cm × 56 cm

Materials: Concrete cement

Location: TTU university press; TTU administration

Date of placement at current location: 2017; 2004

Inscription (if any): None

Foundry/factory: TTU Sculpture Studio

Customer: TTU Sculpture Department

Owner/supervisor: Fredrick Boakye-Yiadom; Kwaku Nkrumah Acquah.

#### **Information on the State of Conservation**

Structural conditions: Surface molds, paint peel-offs, breakages at joints

Surface appearance: Break in joints and Surface discolouration

Presence of treatment/conservation conditions: None

Presence of water: Yes

Vandalism: No

#### **Additional Information**

Brief description of the artworks: Works are in-the-round cement sculptures. The technique used was direct modelling, casting and construction.



**Figure 15.** "Thinker" 2017, Concrete cement, 198 cm × 165 cm × 61 cm.



**Figure 16.** "Diligence" 2004, Concrete cement, 123 cm × 65 cm × 56 cm.

### **3.1.9. Description of the Artwork (Figures 17-19)**

Title(s): Cenotaph; Wise saying; Music

Creation date: 2008; 2005; 2005

Author(s): Students' project

Subject: Marketing

Dimension: 154 cm × 43 cm × 54 cm; 145 cm × 118 cm; 54 cm × 51 cm

Materials: Concrete cement

Location: Adjacent to Electrical Workshop; TTU Hospital

Date of placement at current location: 2008; 2005; 2005

Inscription (if any): None

Foundry/factory: TTU Sculpture Studio

Customer: TTU Sculpture Department

Owner/supervisor: Owusu-Ansah Ankrah; Edwin K. Bodjawah; David Asa-



mani

**Information on the State of Conservation**

Structural conditions: Surface molds, paint peel-offs, breakages at joints

Surface appearance: Break in joints and Surface discolouration

Presence of treatment/conservation conditions: None

Presence of water: Yes

Vandalism: Yes, due to lack of care

**Additional Information**

Brief description of the artworks: Both works are relief and in-the-round cement sculptures. The technique used was direct modelling, casting and construction.



**Figure 17.** “Cenotaph” 2008, Concrete cement, 154 cm × 43 cm × 54 cm.



**Figure 18.** “Wise saying” 2005, Concrete cement, 145 cm × 118 cm.



**Figure 19.** “Music” 2005, Concrete cement, 54 cm × 51 cm.

### **3.1.10. Description of the Artworks (Figures 20-22)**

Title(s): Lovers; Emerging; Signage

Creation date: 2019; 2016; 2018

Author(s): Students’ project

Subject: Recycling

Dimension: 197 cm × 118 cm; 67 cm × 54 cm × 43 cm; 167 cm × 43 cm × 30 cm

Materials: Tyres; Iron rods and Sachet rubbers; Metal, wood and concrete cement

Location: TTU Hospital; FAAT block; FAAT entrance

Date of placement at current location: 2019; 2016; 2018

Inscription (if any): None

Foundry/factory: TTU Sculpture Studio

Customer: TTU Sculpture Department

Owner/supervisor: Andrews Tetteh Arko; Alex Darpoh; Fredrick Boakye-Yiadom

#### **Information on the State of Conservation**

Structural conditions: Dust, Peel-offs, material worn-out

Surface appearance: Dust, Peel-offs, material worn-out

Presence of treatment/conservation conditions: None

Presence of water: Yes

Vandalism: No

#### **Additional Information**

Brief description of the artworks: both works are relief and in-the-round mixed media sculptures. The technique used was gluing, metal and wood fabrication and construction.



**Figure 20.** “Lovers” 2019, Tyres × 118 cm.



**Figure 21.** “Emerging” 2016, Iron-197 cm rods, Satchet rubbers and Metal, 67 cm × 54 cm × 43 cm.



**Figure 22.** “Signage” 2018, Wood and Concrete cement, 167 cm × 43 cm × 30 cm.

### 3.2. Audience Responses on Outdoor Artworks

Audience responses were appreciated as an interaction to receive direct feedback from participants during the data collection (Schmidt et al., 2020). The synergy of audience responses is best understood between the artists and the public space. Artists build sculptures for certain locations and determine the best position for them to be placed. According to these responses, the following summary phrases were derived from comprehensive interviews with the respondents:

- a. The respondents were invited to offer their views on the following: materials/techniques/creative process/topics covered and their meaning within the artistic experience/installation and location, starting with the artwork recorded;
- b. Questions about the deterioration of artwork, as well as conservation and repair.

According to respondents, contemporary outdoor artworks are imbued not only aesthetic but also ethical qualities. This concept contributes to the regeneration of the TTU pattern. Aside from their ornamental function, the outdoor artworks take a social dimension and contribute to the enhancement of TTU's environmental settings.

Metal and concrete sculptures have become increasingly popular. "I enjoy the incandescent texture of this cloth". I also enjoy the concept of forging fire. I appreciate how the sculpture looks on the black outer surface, with these lava-like veins", said an **Art lecturer #1**. The artist acknowledges being actively involved in the project and overseeing various stages of execution (**Figure 2, Figure 3, Figure 6, Figure 8, Figure 13, and Figure 14**).

The success of the art project is also determined by the foundry, where workers must have both talent and patience when executing modelling, casting and welding to obtain ideal outcomes even when intricate shapes are present.

**Art lecturer #2** says that:

Artists must know how to work with all materials from a technical point of view. A practice without such exploration takes away their expressiveness. Artists must possess artistic sensibility to accomplish such creative outcomes. This practice climbs to the level of "great poetry". I have learnt to work with a variety of materials, including "metals, wood, terracotta, and even plastics". I enjoy working with fibreglass because it is a lengthy process that allows him to "rethink work, ponder, evaluate mistakes, and alter the approach calmly".

**Art student #1** states that:

The selection of appropriate materials for outdoor artworks is critical. The artist can achieve great levels of sensitivity depending on the material. When it comes to metal, ferrous materials such as steel are particularly ideal for outdoor sculptures because of their longevity. Steel is easily manipulated with powered tools. Steel absorbs and reflects light, which is vital for outdoor works. It is exciting to see how light changes the sculpture depending

on the moment and the atmospheric cycle.

**Art student #2** discloses that:

I choose bronze-coloured paint for my outdoor sculptures because it absorbs light without reflecting it. As a result, the outdoor sculpture is easier to be appreciated without shadows. The public can obtain a feeling of the whole work while not losing details.

**Art student #3** shares that:

I feel that material plays a significant role in the creative process. Not only do outdoor sculptures alter with time, but they also change due to exposure. The sculptures must maintain their “legibility” and essence throughout time to impart ethical and artistic ideals.

**Art lecturer #3** discusses that:

Regular maintenance of outdoor artworks is critical. This practice includes the removal of dust and particulates, monitoring, and periodic re-coating with protective chemicals. Artists conserve their outdoor works by washing the surfaces from time to time. Some sculptures incorporating mechanical mechanisms such as **Figures 1-4, Figure 6, Figure 8, Figure 9, Figure 15** and **Figure 22** require constant maintenance.

All of the artists emphasized that it is important in this case as the Department of Sculpture Technology takes up responsibility for outdoor sculpture maintenance. Some respondents stress more than just maintenance and conservation. Also, some respondents have diverse perspectives in terms of restoring and reintegrating missing parts of artworks.

**Art lecturer #4** states that:

Preserving the works was not the artist who created the responsibility. For some, it is preferable to “leave everything as it is”, rather than replacing damaged or missing parts.

**Art lecturer#5** disagrees that:

An alternative strategy is crucial in preserving the works. The missing components should be reintegrated while being careful not to produce fakes. Also, in restoration, the work should be done by professionals. It is also important to consider the viewpoint of the artists who created them.

**Art student #4** believes that:

When erecting an outdoor artwork, it is advisable to leave boundaries around the work to prevent people from approaching them too closely.

**Art student #5** disagrees that:

An outdoor artwork must be touched to feel the substance of the material. As a result, it must also be appreciated by touch. The substance in the

sculpture is felt before it is seen. When the light is taken away, sculpture perceives it; the blind can see it, but we can too. When the visual aspect is removed, tactile sensitivity improves, and more deep messages are sent to the soul through the hands than through the eyes alone.

**Art student #6** supports that:

An outdoor artwork must be touched. A sculpture is a thing that makes you want to touch it; else, it becomes a symbol if it is badly expressed. The sculpture is both a conceptual and a physical endeavour.

(**Figures 1-3, Figure 6, Figure 8, Figure 9, Figure 15, and Figure 22**) were created by art students from the Department of Sculpture Technology and Department of Industrial Painting and Design, Faculty of Applied Arts and Technology (FAAT), TTU. Under the supervision of their course lecturers and studio technicians, the art students created an artificial patina on the sculptures to simulate the appearance of natural-aged. The artificially created patina using anti-rust ammonium and sulphate salts to create a similar surface to the metal exposed to acid rain and the salty environment was appropriate. In the same vein, **Salvadori et al. (2016)** say that one way to prolong the life span of outdoor sculpture is to coat its surface with protective material and its maintenance must be identified and prioritized. The art students also used different anti-rust colours (black) to coat the surfaces and welded joints of the armature of the sculptures to prevent rust. The art students used sheet metals with fabrication design processes such as concept development.

**Art student #1** (who produced some of the metal sculptures) states that every process in producing sculpture, including sheet metal manufacturing, starts with an idea. The ideas establish realistic project requirements. It again entailed creating a 3D model of the sheet metal component in question. Wall thickness, bend radius, hole orientation, bend allowance, and other specifications were frequently used in the model.

In addition to the idea development, the art students employed an engineering drawing production which utilized the following steps:

Following the creation of the 3D model, the drawing for the production was required. There was the creation of a blueprint before the welding started. The blueprints defined the sheet metal parameters required for the initial drawings. The blueprints were sent to the studio to aid in the material selection, the type of welding technique (arch welding) used and surface finishing (**Art lecturer #1, 2021**).

According to **Art lecturer #2**, the prototypes were developed for producing the sculptures to ensure accuracy in measuring and cutting metals. The production was done through the following: cutting, bending, punching, stamping, are some of the processes the students adopted in the creation of the sculptures. The prototypes had their surfaces coated to improve their looks. The respondent believes that rushing through the processes or skipping a phase could impair the end products' qualities and integrities. The Head of the Department and some

sculpture instructors reviewed the prototypes to ensure satisfaction with the Department's needs.

According to **Studio technician #1**, the art students took the pain to grasp the various procedures used in the production to comprehend the development of the various sections. These sheet metal processing techniques aided the students in transforming flat sheets into three dimensional and functional components.

**Studio technician #2** states that:

The metal sheet processing procedures used by the art students were the most popular technique for metal art production. The initial step in the metal sheet processing used by the students was cutting. The cutting technique consisted of cutting metal sheets into rectangular metal sheets and cutting them to sizes based on the students' part designs.

This metal art practice correlates with **Tognon's (2014)** argument on part design. To Tognon, there cannot be any good art without inputting part design. According to **Studio technician #2**, art students used stationary rod-cutters and bolt-cutters that can handle mild steel up to 1 inch thicker and smaller metals.

### 3.2.1. Joining of the Metals Together

The art students used arc welding (which is also known as or shielded metal arc welding (SMAW), manual metal arc welding (MMAW) or stick welding) to join their cut metal pieces together. An electric current was used to strike an arc between the base material and a consumable electrode rod or stick. The electrode rod is made of a material that is compatible with the base material being welded and was covered with a flux that gave off vapours that serve as a shielding gas and provide a layer of slag, both of which protect the weld area from atmospheric contamination. The electrode core acts as filler material, making a separate filler unnecessary (**Art lecturer #4**, 2021; **Wikipedia contributors**, 2021).

According to **Art student #1**, this process is very versatile, requiring little operator training and inexpensive equipment. However, welding sometimes is rather slow, since the consumable electrodes must be frequently replaced and because slag, the residue from the flux, must be chipped away after welding. Furthermore, the process was generally limited to the welding of ferrous materials (**Art student #2**, 2021).

### 3.2.2. Maintenance of the Sculptures at TTU

According to **Art lecturer #5**, none of the sculptures has been conserved and restored ever since they were mounted at their current places. The lack of maintenance has caused the sculptures to deteriorate. It was established that the deterioration came as a result of dust, fingerprints, salts, fatty acids, polish residues. This argument is in line with **Tognon's (2014)** statement that dust settling on metal sculptures contains salts and particulates that are hygroscopic and can cause local corrosion. In addition, the dust has obscured decorative details and acted as an abrasive against the surfaces.

Fingerprints and perspiration (or sweat) from hands contain salts, oils and moisture that easily transfer onto metal surfaces and has led to noticeable corrosion. According to [Salvadori et al. \(2016\)](#), Sodium chloride (salt) from fingerprints react with mild steel to form steel chloride, which is light sensitive and has to darken over time, resulting in fingerprint stains that are highly visible and obtrusive on the surfaces.

Another common problem observed was that metal and concrete sculptures in the maritime locations (Sekondi-Takoradi) experience the presence of salts (mainly chlorides) in the air (sea salt aerosols). Also, fatty acids were found to have corroded the metal works. The problem was detected through a condition survey. This statement is in line with [Tognon's \(2014\)](#) argument, that the most commonly identified method for the collection of such information is the stock condition survey. Generally, this practice is defined as a systematic survey of the fabric of sculptures to produce accurate information of the condition with an assessment of the extent and timing of future work (maintenance/repairs/replacement). Condition surveys provide maintenance managers with a snapshot of the condition of their stock. This survey enables the development of planned maintenance programmes, as well as the opportunity to consider the effectiveness of previous programmes ([Salvadori et al., 2016](#)).

### **3.2.3. Combined Effects of Pollutants and Contaminants with Relative Humidity**

It was observed that pH has the most influence on the degree of corrosion that pollutants and contaminants can cause. In other words, the higher the pH, the lower the pollutant threshold concentration that can cause the metal to corrode. The next to consider concrete made sculptures.

## **3.3. Outdoor Concrete Sculptures**

**Figure 4, Figure 5, Figures 10-14, Figure 16, Figure 18, Figure 19, and Figure 21** were all made of concrete. The students thought of having a good idea of what they wanted to make before the purchase of their materials. In that case, there are several sketch ideas for the sculptures known as idea development. Armatures were made for the sculptures depending on their sizes. The armatures were built by the techniques of welding. The armatures served as the supports for the sculptures. The armatures were stuffed with expanded foam before concrete is applied on the armatures layer by layer. Some of the sculptures were painted to look attractive and pleasing to the eyes (Per. Comm. with **Art lecturer #5**, 2021). **Figure 11, Figure 19, and Figure 21** were observed to be in relief forms while the rest were built in the round or free standing.

## **3.4. Outdoor Relief Sculptures with Metal and Sachet Plastic Rubbers**

**Figure 7** was made of a tyre strap and glue. This process had the idea development that was transferred to the support (wall) by gluing. The application in the



execution of the sculpture was cutting and gluing. Furthermore, **Figure 17** was made off welded iron rods and covered with sachet plastics by the swing technique, whereas **Figure 20** was made using the assemblage and construction method to combine metal rods and wood. The sachet plastic rubbers (**Figure 17**) was the focus of a multi-analytical approach used to understand the constituent materials. The materials were used as a build-up technique in a state of conservation and production guidelines for its maintenance. This statement goes to confirm **Cucci, Bigazzi and Picollo's (2013)** assertion that for one to understand the nature of the material for the production of art, there must be an assessment based on a multi-analytical approach.

It was a fact from the photographic recording that the number of outdoor sculptures that are not well conserved was very high. Surprisingly, they were created and installed throughout the last decade and the majority in very recent years. The deterioration of the sculptures and the chemical and physical changes are due to environmental exposure, especially in polluted atmospheres. This statement confirms **Wharton's (2005)** argument that particulate deposits favour the attack by air pollutants and microorganisms which penetrate the porous structures of the materials or attack the surfaces of the metals. The degradation is manifested by the discolouration of surfaces, loss of materials and lack of legibility (**Tognon, 2014**). For metal sculptures, the most frequent decay phenomena are corrosion and streaks. Patinas and biological attacks are very frequent in concrete sculptures.

The iron reinforcing of the Drummer indicated in **Figure 4**, has cracked and failed, indicating that the sculptures constructed of concrete have been subjected to significant degradation. The crack occurs when the pH of the substance reacts to carbon dioxide with the elements of the alkaline material. Rusted iron has a larger volume than sound metal, causing traction in the concrete and eventually breaking and collapsing. Furthermore, the sculpture's appearance and its durability have been harmed due to a lack of maintenance. These works of art have been harmed not simply by natural phenomena such as atmospheric agents or human crimes such as vandalism, but also by the negligence of local owners. This argument is in variance with a statement made by Wilhelm von Humboldt (1767-1835), "Think of me, not in grief, but cheerfully. Keep the plasters clean, as that is the main thing". This saying was referred to the plaster casts of famous ancient sculptures he had collected for his family home, Tegel Palace when on his death bed, he spoke these words to his family on April 2<sup>nd</sup> 1835. It is perhaps the most poignant reference to be found on the notorious problem of plaster soiling. It represents a general concern for the effects of the environment on bare plaster surfaces. Humboldt's remark was interpreted as the appeal of an entire generation. It is directed at its posterity to safeguard and cherish the material and cultural legacy of German neoclassicism (**Kamimura et al., 2006**).

#### 4. Conclusion

Compiling data on contemporary outdoor artworks especially sculptures is crit-

ical in terms of knowledge, distribution and scientific information. Database on the outdoor sculptures in TTU serves as the foundation for optimum conservation, i.e., ongoing upkeep. It is critical to prepare data to ensure the best possible conservation when a contemporary sculpture is displayed in a public space. A better inventory of the materials and techniques provides data on the artists, the foundry or the department that assembles the sculpture. Interviews with artists or sculptors should be conducted to collect and report their thoughts on the maintenance actions.

The importance of information on outdoor artworks and artists who produced them together with the indications relating to the conservation of the outdoor sculptures is well known at an international level, aimed at a fruitful interaction between the arts and sciences as well as planning appropriate maintenance procedures. There was enough evidence to conclude that the twenty-two outdoor sculptures had not been documented, preserved, restored and maintained ever since they were created. The outdoor artworks were made of wood, metals, concrete cement, tyres and plastic rubbers. It was evident that ninety per cent of the people interviewed had knowledge about the documentation of the artworks but failed to ensure the same. However, the documentation or cataloguing of the outdoor artworks has reference representation, inspiration, intuition, aesthetics and symbolic importance which much have not been explored.

The documentation or cataloguing of contemporary outdoor artworks and their significance to the world of art protect the societal rich heritage for the present and generations yet born. Therefore, it is recommended that the data on these outdoor artworks should be updated thoroughly with notes on the modality of periodic maintenance or restoration tasks and information on degradation using the econometric model. The research for future implications is necessary to address some untapped areas of conservation and restoration research on the outdoor artworks in institutions, which need to be documented and studied to preserve this rich cultural heritage for posterity. Therefore, artists, art historians, art critics, practitioners and curators should develop strategies to document and study the outdoor artworks in institutions alongside best practices.

### **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.

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