UTILISATION OF METAL AND GLASS IN THE CREATION OF INDOOR SCULPTURES INSPIRED BY SELECTED SWAHILI KANGA INSCRIPTIONS

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A RESEARCH REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTERS OF ARTS (FINE ART) IN THE SCHOOL OF LAW, ARTS AND SOCIAL SCIENCES OF KENYATTA UNIVERSITY.

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DECLARATION

This project report is my original work and has not been presented for award of a degree at any other university.

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DEDICATION

I dedicate this work to my siblings; Sechal Onyiso, Solace Onyiso, Suji Onyiso, Syprose Onyiso and niece June Adhiambo who have been my pillar of strength and encouragement throughout the course of this study.

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OPERATIONAL DEFINITION OF TERMS

The following terms have been defined in the context of their use in the course of the study.

Indoor public spaces: - An enclosed place of business, service related activity either publicly or privately owned and is accessible to the public.

Inscriptions: - Are words or texts that are printed on the Kanga.

Kanga: - A colorful printed cloth wrapper mostly worn by women and occasionally by men along the Coast region in East Africa.

Pithy phrase: - A brief or short statement comprising of two or more illustrative words that express ideas relating to facts of everyday life.

ABSTRACT

Literary works such as phrases and sayings have been applied as a guide in society and serve as a tool to educate, teach human behavior, convey feelings, thoughts and as well entertain. Some artists, according to research have been inspired by proverbs and inscriptions to visually communicate specific attitudes and emotions through artistic works. Despite phrases and other inscriptions being used as inspirational sources in the works of art, there are no studies that indicate evidence of Swahili Kanga inscriptions that have been used as inspiration in the creation of sculptures in Kenya. In light of this gap, this study developed sculptural ideas from selected Swahili Kanga inscriptions. The developed sculptural ideas were visually illustrated into indoor sculptures using metal and glass to augment proverbial and non-proverbial selected Swahili inscriptions. The indoor sculptures were suitable for selected indoor public spaces which are public libraries, restaurants and airport waiting areas. This study applied an exploratory research design in exploring Swahili inscriptions on Kanga, where the selected Swahili inscriptions were done purposively and categorised to various themes. The intervening variables in the creation of indoor sculptures are materials, joining and finishing techniques. Tests were carried out using various techniques on metal such as welding, forging, bending and riveting. Techniques such as soldering, leading, use of glass beads and mosaic were used in the case of glass. The test results of finishing techniques such as polishing, texturing, lacquer application and painting were applied in the final creative project.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Phrases and proverbs are well known for reflecting societal ideals and for including frequently used and accepted assessments of human conduct or acts in various events and situations (Ramin, 2019). According to Ehondor (2017) proverbs and other pithy inscriptions in Africa are defined as the min verbal communication. They continue to be a primary mode of communication in African communities as they are used to impart and pass knowledge to others, make conversations, entertain and enhance meaning.

The history of the Kanga, a colorful printed cloth wrapper worn mostly by women, demonstrates how the Kenyan Coast has been engaged with global trade for eras as it was a product of political and economic relations between Europe, East African Coast and the Indian Ocean (Beck, 2005). As a result, it has arisen as a region marked by high cultural hybridity and the richness of the Kiswahili language, both of which have had a significant impact on the inter-ethnic interactions. Kanga are precise and have a lot of meaning (Leyden, 2012). This demonstrates that Swahili Kanga inscriptions are used to communicate both orally and in written form.

In terms of artistic expression, there exists a confluence between written work such as contained in phrases, proverbs and artistic works. It can be argued that the message contained in these inscriptions can be converted to some form visual interpretation. Some artists, according to research have been inspired by proverbs and other pithy inscriptions to communicate specific attitudes and emotions visually through painting, sculpture and illustrations. When it comes to sculptural works, space is a crucial aspect since it interacts with the work through appreciating the sculpture and the type of place it is in (Hopkins, 2003). You & Li (2020) explain that when admiring a sculpture, a viewer can gather information from the space. Shape, feeling and color through observation. It is challenging to appreciate and attain a chic appealing environment without the creation of indoor artworks.

Sculptures have also been inspired by proverbs and slogans, in which shapes, forms and objects that may or may not be related to one another are combined or made to communicate specific emotions or attitudes in order to depict them visually. The beauty of the shapes formed, materials used and assemblage of pieces to convey specific ideas

that aid in the communication process are all factors that contribute to the worth of sculpture (Wichaya, 2021). In Kenya, Swahili proverbs have been employed through illustrations by Musa Omusi, an illustrator, who has turned his artistic interpretations of the sayings into poster prints, t-shirts and pillow cases (Gakuru, 2016). This however indicates that there is inadequate information on sculptures created that are inspired by Swahili Kanga inscriptions. In addition, there is barely any documentation of Swahili Kanga phrases and proverbs being an inspirational element in the creation of sculptures in Kenya.

According to a pilot investigation conducted by the researcher to establish the source of Swahili Kanga inscription in two prominent textile companies; Rivertex and Nairobi textiles, the investigation revealed that the origin of inscriptions emanate from interested clientele. The inscriptions are then printed on Kanga in factories and later distributed in textile shops countrywide or to either a target market or audience. This study explored Swahili Kanga inscriptions by extracting, analysing and developing ideas from the selected proverbial and non-proverbial phrases. These inscriptions were used in the creation of indoor sculptures using metal and glass as a material for indoor public spaces in restaurants, public libraries and airport waiting areas. The results of the study are envisaged to assist the relevant audiences on the benefits of using readily available materials for the creation of sculptural works and also presenting Swahili Kanga inscriptions in a new dimension of visual communication.

1.2 Statement of the Problem

Visual communication is a form of art that is a strong medium for delivering information, entertaining and enlightening an audience using images and forms (Ijaz, 2018). Subsequently sculpture as an integral discipline of the visual arts is used for expressing certain ideas to an audience. Swahili Kanga inscriptions are known to serve a communicative purpose. Often worn by women, the Kanga contains proverbs, pithy phrases and other sayings that are a medium of communication, making the cloth play a significant role in gender and social relations (Ryan, 2017). Luis (2021) supports the use of sayings in the creative space through comic books as they demonstrate a creative and aesthetic appreciation in the visual depiction of a message they impart. From preliminary studies, it is evident that in other parts of the world proverbs and pithy phrases have been used as inspirational sources to create sculptures. However, there is hardly any documentation of Swahili inscriptions extracted from the Kanga which have

been used and transformed into inspirational sculptural creations in Kenya. Subsequently, this study extracted sculptural ideas from selected Swahili Kanga inscriptions and developed them into thematic sculptures that communicate the desired visual message. This therefore deconstructed the inscriptions into tangible sculptures for indoor public spaces of restaurants, public libraries and airport waiting areas using metal and glass as the materials of choice.

1.3 Objectives of the Study

The objectives of the study were to:

i. Select and categorise Swahili Kanga inscriptions that can be used as inspiration for the creation of indoor sculptures.
ii. Develop ideas extracted from the selected Swahili Kanga inscriptions and which are suitable in the creation of indoor sculptures for the selected spaces.
iii. Determine through experimentation suitable techniques for converting developed ideas into tangible visual indoor sculptures for the selected spaces.
iv. Apply suitable techniques in metal and glass to create thematic indoor sculptures for the selected spaces.

1.4 Research Questions

The research was guided by the following questions.

i. How can Swahili Kanga inscriptions used as inspiration in the creation of indoor sculptures be selected and categorised?
ii. How can ideas extracted from the selected Swahili Kanga inscriptions and which are suitable in the creation of indoor sculptures for the selected areas be developed?
iii. What suitable techniques for converting developed ideas into tangible visual indoor sculptures for the selected spaces be determined through experimentation?
iv. How can suitable techniques using metal and glass to create thematic indoor sculptures for the selected spaces be applied?

1.5 Justification

This study used the Swahili inscriptions printed on the Kanga whose proverbs, pithy phrases and social commentary serve as inspirational sources in the creation of indoor sculptures using metal and glass. Since sculpture is already recognized and celebrated as a fundamental artistic discipline that is used for social expression, it is imperative and necessary that printed inscriptions be converted into a tangible avenue for visual communication. It is also critical that the audience or general public be given an alternative avenue for social and cultural interaction through art. This is because art placed in public spaces whether indoor or outdoor is highly interactive.

Zeng and Jiang (2018) assert that art plays a vital role in beautification as it meets the aesthetic value of the space design where it creates an artistic feature, forming a new decorative style. Therefore it is envisaged that creation of indoor sculptures using metal and glass would not only create a new dimension of visual communication but would also improve the quality of indoor public spaces.

This study sought to significantly add to the body of knowledge in the field of Fine Art. The use of both metal and glass as a material would also contribute towards enlightening artists on the benefits of utilising different materials for the creation of sculptural works.

1.6 Scope and Limitations of the Study

This study explored a collection of Swahili proverbial and non-proverbial Kanga inscriptions as a source of inspiration for sculptural work. A selected number of Kanga inscriptions was used to develop sculptural ideas in order to create indoor sculptures using metal and glass. Not all inscriptions by nature or their verbal structure were readily convertible or interpretable into sculptural ideas. The researcher therefore needed to choose very carefully in order to sustain the fundamental meaning.

While there were broad experiments conducted to determine various techniques, this study confined itself to the results of experimentation in techniques which were then applied in the creative project.

All sculptures were in the round and executed in combining metal and glass. The sizes of the indoor sculptures were of varied dimensions to create variety.

According to Amate (2011) sayings and phrases are classified according to subject matter, content, style, function and theme. They can be categorised as moral values such as hard work, unity, success, justice, patience, patriotism and loyalty. Others can be classified under intellectual conditions of man such as wisdom, foolishness or disrespect. Phrases that deal with; domestic, social, political life of people, that talk about animals or man and animals, that mention God or earth, that refer to the general state of man on his fate and destiny and which deal with object of nature and natural resources are also various ways of categorising sayings. The researcher categorised the inscriptions into 8 themes where 24 selected Swahili Kanga inscriptions were used in the creation of thematic indoor sculptures.

Maybury (2021) states that various forms of art in indoor public places such as hotels and airports provide comfort and create visual aesthetics where people can relax, unwind and interact with the artworks in these enclosed spaces. Incorporating visual arts in restaurants creates an artistic atmosphere and enhances the experience for both customers and staff where works of art are not only limited to exhibitions, museums and galleries (Xu, 2018).Therefore the researcher selected public libraries, restaurants and airport waiting areas as the indoor public places for study as they are enclosed locations that would provide adequate spaces for the indoor sculptures that were created to be placed in.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter presents a relevant literature review in areas that cover; Kanga, inscriptions, metal and glass sculpture, techniques used, indoor sculptures.

2.1 Kanga

The term Kanga is believed to derive from a guinea fowl, a bird known as Kanga in Swahili due to its designs with spots and bright patterns that resemble the bird. Kanga was also known as “leso ya kushona” which means sewn leso, was inspired by the “leso” that is also used in reference to the cloth along the East African coast (Biersteker & Amory, 2017). The term “leso” is from the Portuguese term “lenco” which means handkerchief. They feature bold designs in varying colors with phrases and proverbial inscription printed on them. Due to the rapid change in the Kanga textile industry, the result on the view of Kanga usage shifts away from communicative functions and transmitting messages to becoming a valuable item of clothing by passing information about a person’s identity, relationship or status (Birch & Lutomia, 2017). Plate 2.1 below shows an example of a kanga inscription.

Plate 2.1: Swahili kanga and inscription on the cloth.

Sources: artsandculture.google.com

The Kanga is used for various purposes in celebration such as birth, wedding, burial ceremonies, national days and in traditional dances (Beck, 2005). Women in East Africa exchange Kanga as gifts with mothers buying or handing down cloths to their daughters as a generational inheritance. Collection of Kanga has also functioned as a form of wealth for Swahili women as they can be re-sold (Biersteker & Amory, 2017). Apart from being a visual communicative tool, the Kanga has been used in interior décor and made into apparels and accessories to express fashion as well throughout East Africa and other parts of the world (Kimani, 2018). Kimani adds that it is a fabric that represents a channel through which an independent and collective identity is preserved. Plate 2.2 and 2.3 below shows examples of how the Kanga has been used.

Plate 2.2: Pillow cases made of Kanga.

Source: youkhanga.com

Plate 2.3: Bag made of Kanga.

Source: kenyakangacollection.com

2.2 Inscriptions

Collins (2009) defines inscriptions as writings imprinted into clothes made of different types of fabric. The inscriptions on the cloth express different meanings to people depending on where and also provide information to others (Marshall et al, 2000). They are often designed for public observation. Khan (2019) suggests that inscriptions are important as they give insights into cultural aspects, socio-economic conditions and political features of a society. As noted by Costandius (2007) African oral communication is rich in pithy phrases and proverbs and therefore there is need for visual communication as its scarcity makes it challenging to influence the visual language. In Ghana, Akan art embodies invaluable cultural information that reflects its beliefs, proverbs, other slogans and various intangible ideas made tangible, thus establishing an inseparable link between visual art and the intangible (Labi, 2016). In East Africa, inscriptions on the Kanga show both proverbial and non-proverbial traits which include pithy phrases or slogans, social commentary and proverbs (Beck, 2005). Swahili sayings and proverbs trace their origins through centuries of cultural exchange with influences from Arabic, Persian, Indian and European cultures. Swahili was derived from the Arabic sahil term which means boundary or coast. (Biersteker & Amory, 2017). The name of the language is Kiswahili which means the language of the coast. Rooted in the oral tradition, these sayings have been passed down from generation to generation. They serve as expressions of shared experiences, values

within Swahili-speaking communities. They also reflect the coastal region's history as an intersection of trade and interaction. This describes how diverse peoples and civilization converged bringing with them a wealth of cultural, linguistic and philosophical influences. In addition, Swahili proverbs and sayings often draw inspiration from the natural world and historical events of the Swahili people. They still continue to play an important role in preserving and conveying the rich heritage of Swahili culture. According to Gakuru (2016) Musa Omusi has brought the Swahili proverbs to light through his graphic illustrations. Plate 2.4 and 2.5 below show examples of illustrations of Swahili proverbs by illustrator Musa Omusi.

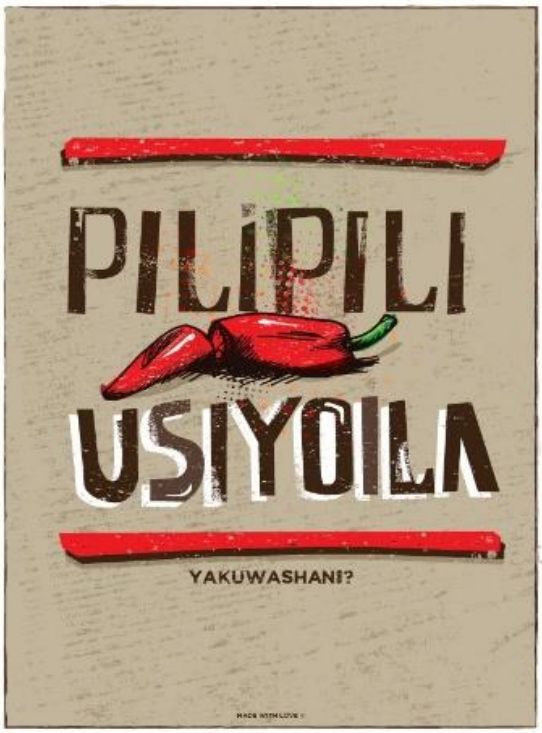


Plate 2.4: Pilipili usioila yakuwashiani illustration by Musa Omusi.

Source: pinterest.com

Plate 2.5: Akili ni nywele, kila mtu ana zake illustration by Musa Omusi.

Source: trueafrica.com

Wango (2012) embarks on the use of illustration in the interpretation of proverbs in Secondary schools in Kiambu County, Kenya. According to Wango (2012) after a preliminary survey that was carried out within the study, it indicated that visual illustration of proverbs was not applied as a method of helping students understand the meaning of proverbs in Secondary schools. The aim of the study was to fill the gap by incorporating visual illustrations. This was to determine uptake of meaning in proverbs and examine the impact of visual interpretation of proverbs by students in the selected secondary schools. However the documentation on use of Swahili Kanga inscriptions has not been explored in the creation of sculptural works and thus for this reason this study filled the gap by using selected Swahili Kanga inscriptions as a source of inspiration in the creation of sculptures for indoor public spaces.

2.3 Metal and glass sculpture

Discarded items or scrap materials provide a bountiful resource for artists in utilising found objects to something creative (Mears, 2018). Mears adds that artists may be inspired to create artistic works such a mixed media, paintings and sculptures from scrap materials such as glass and metal, taking them to new environments and leaving indelible imprint on the mind of its observers.

One of the artists that have used both metal and glass to create sculptures are Albert Paley, a metal sculptor and artist who uses metallic materials, fuses them with glass to create sculptural works (Borgna, 2016). David Bennett is also known for using both glass and metal in the creation of figurative sculptures by use of glass blowing technique into metal (Online Glass Art Gallery - Holsten Galleries, n.d.). Plate 2.3 shows an example of David Bennett sculpture.

Plate 2.6: Sculpture in metal and glass by David Bennett's.

Source: 1stdibs.com

This study used metal and glass as a material for creation of sculptural works.

2.3.1 Techniques used in metal and glass sculpture

The transformation of metal into work of art through various techniques such as cutting, forging and welding seeks the idea of perfection of opening to another dimension on the world (Morosanu et al, 2016). Metal sculpture obtained through this processes can be transformed to various shapes and forms such as human figures, abstract, plants, animals or insects providing the viewers a show of artistry. There are various techniques of joining metal together such as mechanical interlocking, mechanical connection, welding, casting soldering and brazing processes. (Donkor, 2018). There are four main types of welding processes. Stick welding also known as shield metal arc welding (SMAW). The second one is gas metal arc welding, generally referred to as metal inert gas (MIG). Gas tungsten arc welding, known as tungsten inert gas (TIG). The fourth welding process is flux cored arc welding, referred to as flux cored welding. He adds that these techniques in scrap metal have preferred characteristics in the creation of sculptural works and can be used for both interior and exterior purposes. Finishing processes aim to modify the surface of the manufactured part in order to achieve a

certain characteristic. These processes remove bumps and creates a fine and shiny surface (Metalworking, 2013). The main categories of finishing processes are removing, reshaping or adding (3dexperience Platform, n.d.). They transform the surface to achieve a desired finish by removing or reshaping of a metal piece. The other processes are plating, polishing, sand blasting, engraving and mirror finishing. Luminoso (2020) describes the mirror finish to be very reflective with a high degree of clarity obtained by using finer abrasives in various steps. This technique is often used for architectural and ornamental purposes. Jeff Koons one of the contemporary artists has employed this technique using stainless steel to create his sculptures that come in colors, the “Balloon Dog” which are pop cultural icons (Jeff Koons' Balloon Dog - A Look at the Iconic "Balloon Dog" Sculpture, 2021).Glass is a medium that can have different textures, colors, finishes and can be shaped into decorative or sculptural pieces (Glass as Artistic Medium, 2019). According to Herzog & Perreira (2016) glass art involves techniques such as blowing, fusing, kiln casting, hot sculpting and slumping which can be applied to create artistic works. Combined glass techniques are also used by artists like Karen Willenbrink and William Morris where they combine glass blowing with furnace (Online Glass Art Gallery - Holsten Galleries, n.d.). This is achieved by first blowing one or more bubbles of glass and shaping it to a sculptural form. This study utilised various techniques where experiments were carried out and later applied in the final project.

2.4 Indoor public spaces

Space is a vital element as it engages our senses in creating experiences that enhance and elicit human emotions (Adithi, 2018). It also generates relations and experiences as it is made for human practice. Within cities and buildings, there is a great deal of potential for activities and social needs to be facilitated by indoor public and private spaces (Jens & Gregg, 2021). Plate 2.7 below shows examples of indoor public spaces.

Plate 2.7: Indoor public spaces.

Source: untappedcities.com

Qian (2018) states that visual arts plays a vital role in interior surroundings as they enhance people's creative perceptions of certain environments and add to the aesthetic ambiance, which creates a sense of place. The utilisation and fulfillment of the practical use of space is the major objective when it comes to artworks and indoor spaces. People can engage with the artworks and environment through this channel as it creates a visual aesthetic effect. According to Hopkins (2003), a sculpture requires both touch and viewing, thus space is important when appreciating it. Plate 2.8 below shows examples of sculptures in indoor public spaces.

Plate 2.8: Sculptures in indoor public spaces.

Source: *hoagonsight.com*

2.5 Indoor sculptures

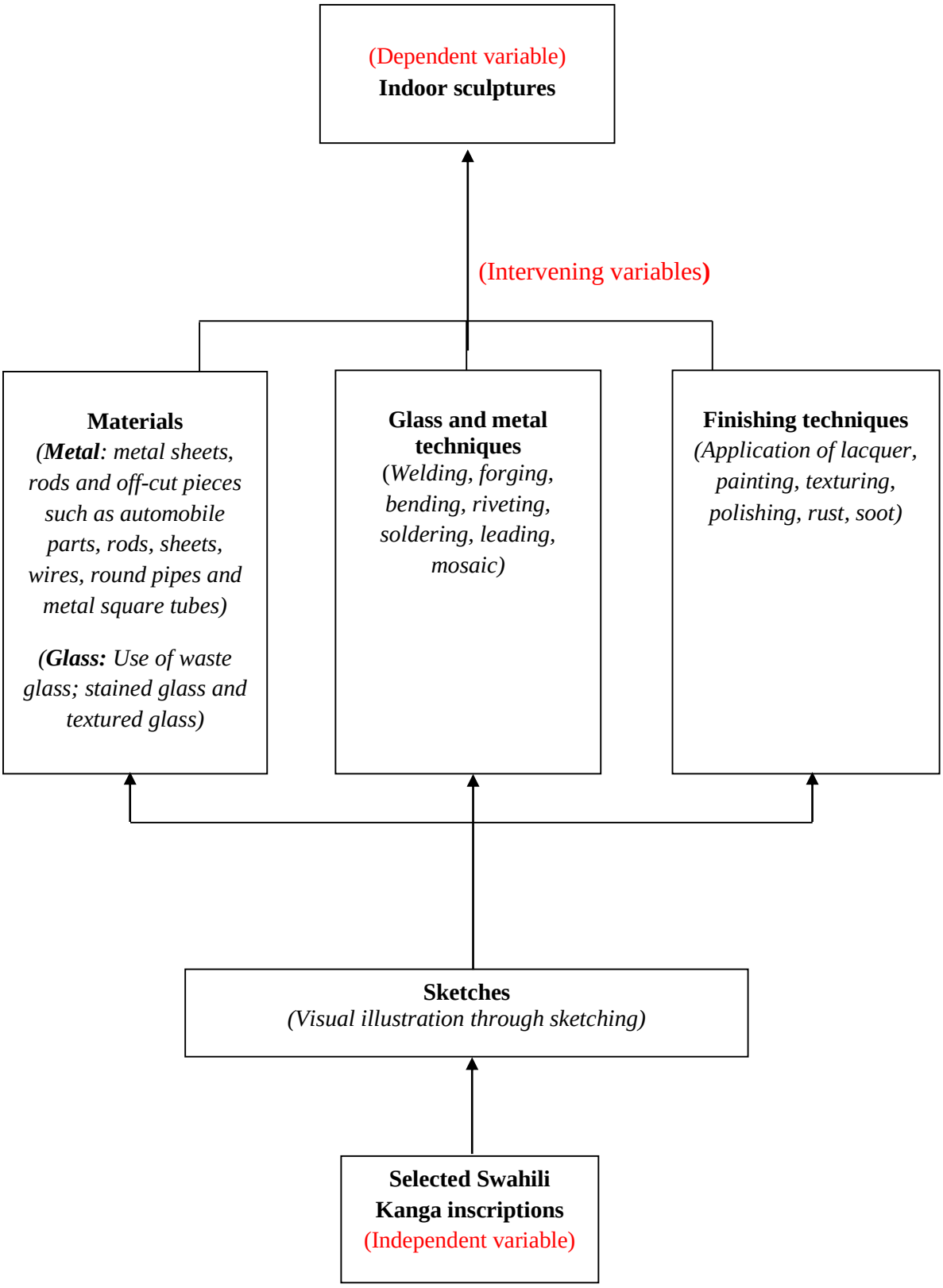
Indoor sculptures are created using various materials such as metal, glass, stone and wood for indoor display unlike open-air sculptures which are aesthetically created to enhance outside surroundings using durable materials to withstand certain weather conditions (Indoor sculpture – From the Fort Wayne Museum of Art, 2021). Elements of artistic works such as texture, color and shape have visual artistic features that have an effect on people where imaginations are formed (Zeng & Jiang, 2018). Indoor sculptures have an aesthetic function on the use of interior spaces both in public and private indoor spaces. He adds that the use of waste materials play an important role in interior space as they express design concepts which when used creatively to create an artwork, becomes an environmental friendly design trend and save costs on decorative materials. At the various stages of societal development, the interior not only serves as a special expression to reflect the language of the builders and designers but also as a canvas for the talent of various artists such as glassblowers, metalworkers, ceramists and weavers (Kuleeva et al., 2021).

Sculpture has reached the highest levels of artistic professionalism along with other forms of arts such as painting and ceramics. Beautiful interior surroundings constitute a vital factor in the development of a visual insight and attaining an aesthetic need. This is achievable through application of art principles to the artworks, their arrangement and use in particular spaces (Arora, 2015). According to (DeSimone, 2015) artists such as Nick Cave create sculptures using found objects that project out from the wall and installations enveloping entire rooms and Graham Caldwell, a New York based artist uses glass as a sculptural medium. They use their sculptural pieces to bring interior spaces to life. The creation of indoor sculptures in this study was not only intended to create a new dimension of visual communication but also improve the quality of indoor public spaces such as restaurants, airport waiting areas and public libraries.

2.6 Conceptual Framework

The conceptual framework indicated the dependent variable which is indoor sculptures while the independent variable was the selected Swahili kanga inscriptions. The intervening variables in the creation of indoor sculptures included: the artistic designs through sketches created from the selected Swahili kanga inscriptions. It also included techniques

Figure 2.1: Conceptual Framework



CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

This chapter focuses on the research methodology, data collection and data analysis process in the creation of indoor sculptures using metal and glass inspired by selected Swahili Kanga inscriptions.

3.1 Research design

This study applied an exploratory research design. Exploratory design is usually conducted to study a problem or phenomena on which little or no previous research has been done (Pawar, 2020). Exploratory study according to Smstudy.com (2016), is used for investigating an issue or subject matter and helps the researcher to develop a better understanding of the problem. As there are no studies that show evidence of Swahili Kanga inscriptions that have been used as a source of inspiration in the creation of sculptural forms, this research design therefore used the Swahili inscriptions printed on the Kanga as inspirational sources in the creation of indoor sculptures using metal and glass.

3.2 Study Area

The study area was the indoor public space selected for the placement of the indoor sculptures. The spaces are public libraries, restaurants and airport waiting areas. Sculptural ideas were extracted from selected Swahili Kanga inscriptions and developed them to thematic sculptures using metal and glass. Experimentation and creation of the sculptures in metal and glass were carried out using various techniques in the sculpture studio of Kenyatta University, Department of Fine Art and Design and Pambazukoglashaus Ltd.

3.3 Sample and Sampling techniques

A sample is defined as a smaller set of people or items selected from a larger population to a pre-defined selection method. Taherdoost (2016) explains that the sample should be a representative to ensure that the conclusions from the study sample can be applied to the total population. The samples in this study were Swahili Kanga inscriptions.

Purposive sampling was used to sample the selected Swahili inscriptions printed on the Kanga based on the desired interpretation of the inscriptions for sculptural purposes. Etikan (2016) defines purposive sampling also known as judgment sampling as an

approach where the researcher decides on what needs to be known using his or her own judgment when selecting members of a population to participate in a study. This sampling technique was also used when selecting techniques used in metal and glass in the creation of indoor sculptures inspired by the selected Swahili Kanga inscriptions.

3.4 Sample Size

There are quite a number of Swahili inscriptions printed on the Kanga that exist. Mugenda & Mugenda (2003) notes that 30% of the target population is a decent representation thus out of eighty Swahili Kanga inscriptions, twenty four were used in the creation of indoor sculptures.

3.5 Data collection tools

The study used the following tools and techniques of data collection:

3.5.1 Data on selection and categorisation of Swahili Kanga inscriptions that can be used as inspiration for the creation of indoor sculptures

Panchenko & Samovilova (2020) describes secondary data as raw-data collected by someone other than the researcher where during the secondary research the author may draw data from documents, statistical data base, scientific papers and others. The researcher therefore used secondary sources such as literary materials from books, articles, journals and digital sources to obtain data on categories of Swahili inscriptions. Appendix A Table 1 lists the different inscriptions that are in the same category. Selection and categorisation of specific Swahili Kanga inscriptions was done purposively by the researcher from the data obtained.

3.5.2 Data on development of ideas extracted from the selected Swahili Kanga inscriptions and which are suitable in the creation of indoor sculptures for the selected spaces

Sketching is a direct way of putting your thoughts where it is effective in ordering one's thoughts, better understanding and an iterative way of developing ideas (Waanders, Eggink & Mulder, 2011).They continue to explain that sketching can be considered as a tool to make better designs and a guide in the design development process. The design process entailed use of photographs and sculptural ideas as inspirations on various themes of the Swahili Kanga inscriptions that guided the researcher in the development of sketches.

3.5.3 Experimentation on suitable techniques for converting developed ideas into tangible visual indoor sculptures for the selected spaces

An experimental data collection method was applied in the experimentation of metal and glass as a material for sculpture to determine which technique were suitable for creation of sculptures for indoor public spaces. The researcher experimented with metal and glass by creating forms from the developed ideas, incorporating intervening variables which are techniques used in both materials and finishing techniques. Kabir (2016) describes that systematic observation entails careful planning of what the study wants to observe and later recording the observed data to allow the information to be interpreted and analysed. The test results were then recorded using a camera in order to show the joinery and finishing technique results as indicated in observational Table 3 provided in Appendix C. Each test yielded a category of data which was analysed to determine the effectiveness desired by the researcher employing metal and glass as a material in sculpture.

3.5.4 Application of suitable techniques in metal and glass to create thematic indoor sculptures for the selected spaces

The researcher employed different techniques in metal such as welding, bending, forging and riveting. Other techniques such as soldering, leading and mosaic were used in the case of glass. Finishing techniques such as polishing, application of lacquer, painting and texturing were also applied in creation of indoor sculptures. Appendix D Table 4 provided a summary of the creative project. The sculptural forms created were able to project metal and glass as an important material in sculpture.

3.6 Data Analysis

The study carried out analysis as follows:

3.6.1 Analysis on selection and categorisation of Swahili Kanga inscriptions that can be used as inspiration for the creation of indoor sculptures

Data gathered comprising of categories of Swahili inscriptions on the Kanga were used. Content analysis is a method used to analyse visual or written documentation that can be applied quantitatively or qualitatively. This provides an opportunity to categorise or code themes that develop from the documents (Wilson, 2011).The researcher used content analysis provided on Table 2 Appendix B to get the number of Swahili inscriptions that were used from the categories and themes that were selected.

Categorisation is a qualitative data analysis process of arranging data in groups according to the similarity where the researcher has to classify his or her data into required categories (Kabir, 2016). Data on categorisation of Swahili inscriptions was analysed using percentages that were presented using pie charts.

3.6.2 Analysis on development of ideas extracted from the selected Swahili Kanga inscriptions and which are suitable in the creation of indoor sculptures for the selected spaces

The researcher analysed data collected from the observation guide. Data gathered from photographs and sculptural ideas as inspirations on various themes of the Swahili Kanga inscriptions were visually illustrated through the sketches developed. This was done through examination of the inscribed message to determine the existence of visual clues that are sculpturally interpretable. The design process was shown in the sketch book. This aided in design development by coming up with visual designs that were illustrated to sculptural forms.

3.6.3 Analysis of experimentation on suitable techniques for converting developed ideas into tangible visual indoor sculptures for the selected spaces

In observational Table 2 Appendix B, the researcher recorded observational data yielded from each test as well as deduced conclusions from metal and glass tests using forms from developed ideas which included the incorporation of intervening variables such as finishing and various techniques used in both materials.

3.6.4 Analysis on application of suitable techniques in metal and glass to create thematic indoor sculptures for the selected spaces

Principles of sculptural design regulate the approaches of sculptors to a number of vital characteristics such as proportion, orientation, balance and scale. Sculptural principles

such as proportion, scale and balance were used in the creation of indoor sculptures for indoor public spaces. The visual ideas developed on the selected Swahili Kanga inscriptions were visually illustrated through developing artistic sculptural abstract and realistic compositions. This was done by sketching, selecting the final refined sketches and finally creating indoor sculptures using metal and glass as a material. The number of sculptures that were created were guided by the techniques used in metal, glass and themes of the selected Swahili Kanga inscriptions.

3.7 Ethical Consideration

The thematic indoor sculptures that were created for Kenyan indoor public spaces kept to the norms of the Kenyan citizens.

CHAPTER FOUR: PRESENTATION AND ANALYSIS OF DATA

4.0 Introduction

This chapter focuses on the presentation and analysis of data obtained in view of the four objectives of the study.

4.1 Data presentation and analysis for objective one

The researcher selected Swahili inscriptions from literary materials such as books, articles and journals. Table 4.1 below shows the number of inscriptions that were purposively selected by the researcher from 4 literary sources.

Book/ article/journal title	**Source**	**Number of inscriptions**
Swahili Wisdom/Sayings ~ Kangas	Mutere, M. (2015)	73
Swahili Grammar for Introductory and Intermediate Levels	Oswald et al. (2014)	2
Swahili Language and Culture	Ali. H, O., & Ali. K, O. (2004)	3
Swahili proverbs II*: (436 in total- Kanga sayings)*	Africanmanners (2012)	2
		Total:80 inscriptions

Table 4.1: Swahili Kanga inscriptions selected from literary sources.

The themes suitable for the study were kindness, love, patience, greed, hard work, caution, unity and universe. Each theme contained ten inscriptions where the researcher purposively selected three inscriptions each from eight themes. This gave a total number of twenty four selected Swahili inscriptions. The themes were grouped into three categories, that is; categories of inscriptions on moral values, intellectual conditions of man and those that mention earth as illustrated in Figure 4.1 below.

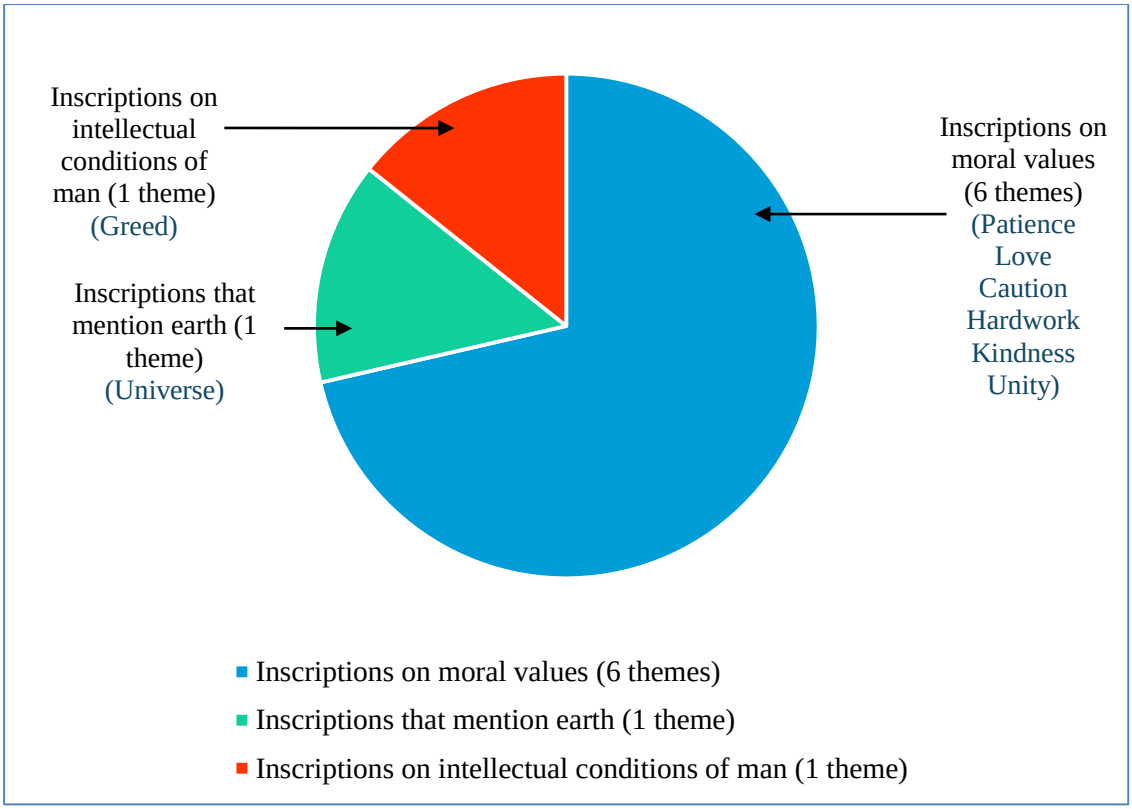


Figure 4.1: Categories of selected Swahili inscriptions

4.2 Data presentation and analysis for objective two

The second objective developed ideas extracted from the selected Swahili Kanga inscriptions which were suitable in the creation of indoor sculptures for the selected spaces. The procedure of idea development was as follows:

a) Reference

Samples of pictorial representations of each theme as inspirations were collected from internet sources and the library. The purpose of this was to make proper references for accurate depictions of forms as they would appear in each thematic interpretation and subsequently as developed sculptural interpretations.

b) Preliminary sketches

Simple preliminary sketches were done on cartridge and brown paper using oil pastels, color, graphite and charcoal pencil to study the shapes of human, insect, birds and animal forms to create a suitable layout, which was subsequently advanced into

developed sketches. Preliminary sketches helped to generate ideas and lay out sculptural possibilities

c) Developed sketches

Developed sketches enhanced the form and shape of each emerging sculptural form, incorporating more details and consolidating the composition in preparation for the final sketches.

Project 1.

Swahili inscription: Kidole kimoja hakivunji chawa, (One finger cannot kill lice. It is possible to achieve greater success when you have the support of others) ***source;*** *Oswald et al (2014).*

Description: This conveys the idea that some tasks or challenges are too big to be accomplished by a single individual or small effort alone. It emphasizes the importance of collaboration, teamwork and collective effort to achieve significant goals.

Reference.

Ants tackling and moving an obstacle in a group to portray team work.

Plate 4.1: Project 1, reference

Source: depositphotos.com

Plate 4.2 shows a preliminary sketch derived from the pictorial representation where several ants are working together to arrange a stack of food to depict unity. Plate 4.3 shows the developed sketch showing different views of the sculptural form.

Plate 4.2: Preliminary sketch

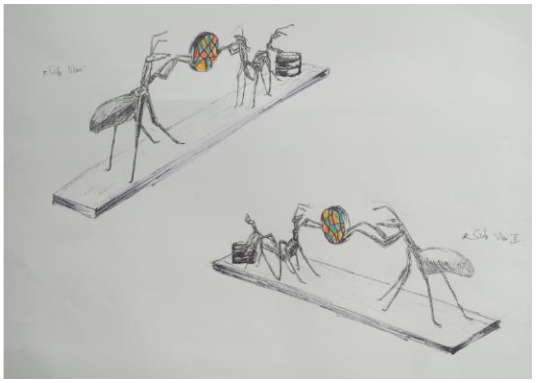


Plate 4.3: Developed sketch

Project 2.

Swahili inscription: Ondoka twende, (Move, let's go!) ***source;*** *Mutere, M. (2015)*

Description: This phrase conveys a sense of determination, moving forward, encouragement and willingness to take the next steps in a journey or a task.

Reference.

Wasps building a paper-like nest portraying unanimity.

Plate 4.4: Project 2, reference

Source: www.pinterest.com

The preliminary sketch was developed from the image (Plate 4.5). Side and back view of the developed sketch (4.6).

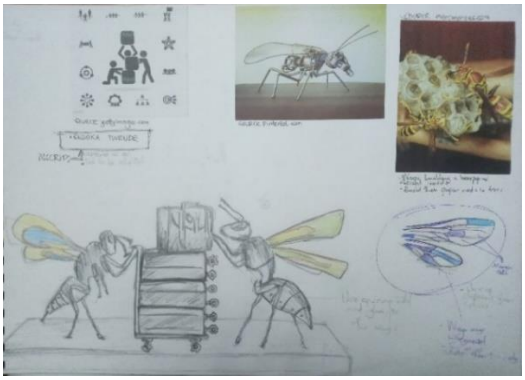


Plate 4.5: Preliminary sketch

Plate 4.6: Developed sketch

Project 3.

Swahili inscription: Umoja ni nguvu, (Unity is strength) ***source;*** *Mutere, M. (2015)*

Description: This proverb conveys the idea that individuals or groups are more powerful and resilient when they work together. It also suggests that when people unite and put their efforts, resources and skills together, they can accomplish more than they would individually. It encourages people to set asde differences and join forces to achieve a shared objective.

Reference.

Plate 4.7 shows an illustration of both men and a woman accomplishing a task depicting cooperation and teamwork. Plate 4.8 and 4.9 shows Samburu and Turkana women with ornamentation.

Plate 4.7: Project 3, reference

Source: icon.library.com

Plate 4.8: Project 3, reference

Source: www alamy.com

Plate 4.9: Project 3, reference

Source: africadigna.org

Plate 4.10 shows a preliminary sketch illustrating abstract human figures of Samburu and Turkana people lifting a book. Plate 4.11 shows the developed sketch showing different views of the sculptural form.

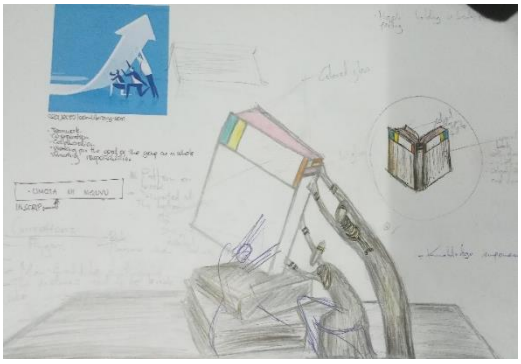


Plate 4.10: Preliminary sketch

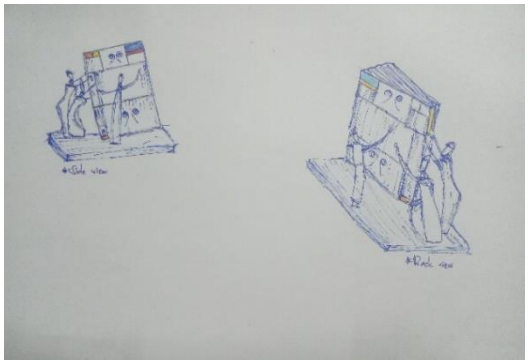


Plate 4.11: Developed sketch

Project 4.

Swahili inscription: Changu chetu,chako chako, (Mine is ours, yours is yours)

source; *Mutere, M. (2015)*

Description: This phrase describes an attitude of possessiveness and selfishness. The saying highlights the negative aspects of greed, where individuals prioritize their own interest and are unwilling to engage in mutual co-operation or sharing.

Reference.

An illustration depicting greed and birds fighting for food.

Plate 4.12: Project 4, reference

Source: Saatchiart.com

Plate 4.13: Project 4, reference

Source: Reddit.com

A preliminary sketch of birds fighting for food (Plate 4.14). Front, side, aerial and back view (Plate 4.15).

Plate 4.14: Preliminary sketch

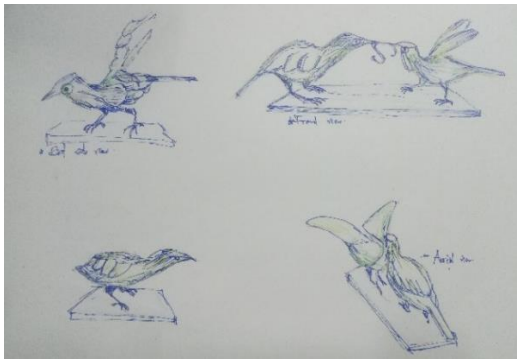


Plate 4.15: Developed sketch

Project 5.

Swahili inscription: Pupa haliishi, (Greed never ends) ***source;*** *Mutere, M. (2015)*

Description: This saying highlights the idea of limitless desire for more, especially wealth or possessions is boundless and can never be satisfied. The concept behind this is rooted in the observation that individuals who are consumed by greed tend to prioritize their own material gains over ethical or moral consideration. The indication is that such individuals are never content with what they possess and are always striving for more wealth or power.

Reference.

An illustration portraying greed and a photo of a frog.

Plate 4.16: Project 5, reference

Source: al.basair.com

Plate 4.17: Project 5, reference

Source: lvzoo.org

A sketch illustrating a frog holding and eating flies to portray limitless and greed having more than enough on plate 4.18. Front, side, and back view (Plate 4.19).

Plate 4.18: Preliminary sketch

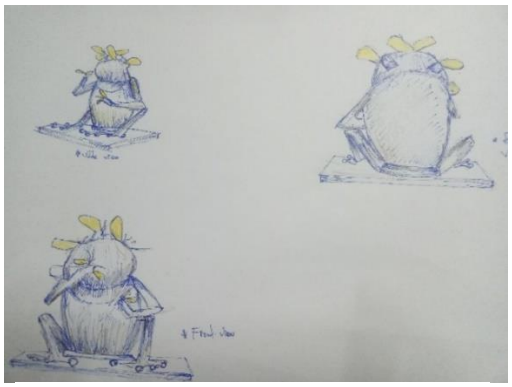


Plate 4.19: Developed sketch

Project 6.

Swahili inscription: Kichache hakikutoshi na kingi hakikulishi, (A little does not satisfy you and more does no feed you) ***source;*** *Mutere, M. (2015)*

Description: This saying conveys the idea that greed is limitless. It suggests that someone who is driven by greed is never content, regardless of how much they have. It further suggests people who are consumed by an unquenchable desire for possessions or power are often dissatisfied. The pursuit for more becomes a never-ending cycle.

Reference.

Plate 4.20: Project 6, reference

Source: artpal.com

A preliminary sketch of a woman holding a bunch of money (Plate 4.21). The adornment on the human figure of the Samburu woman was used to show class and a high status of the woman. Side and back view (Plate 4.22).

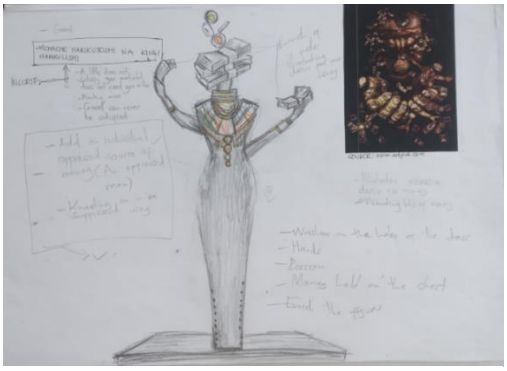


Plate 4.21: Preliminary sketch

Plate 4.22: Developed sketch

Project 7.

Swahili inscription: Akipenda chongo huita kengeza, (Love reflects no evil)

source; *Africanmanners* (2012)

Description: This conveys that true love overlooks flaws and shortcomings. It has the power to overcome challenges or difficulties.

Reference.

Plate 4.23 is a bird feeding her young ones.

Plate 4.23: Project 7, reference

Source: youtube.com

A sketch illustrating a mother's love portrayed by feeding her young ones (Plate 4.24). Side and back view (Plate 4.25).

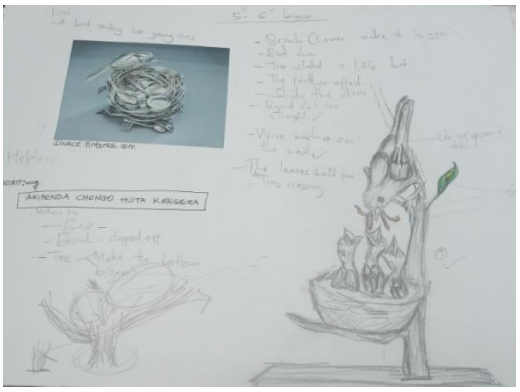


Plate 4.24: Preliminary sketch

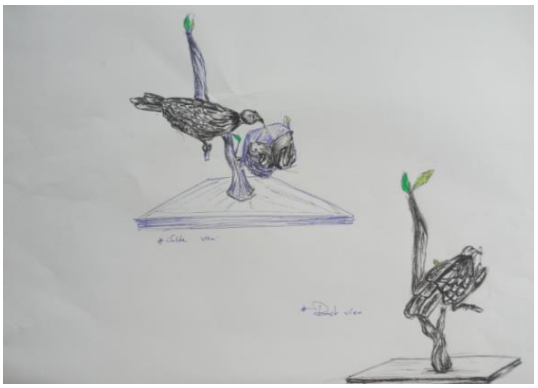


Plate 4.25: Developed sketch

Project 8.

Swahili inscription: Kipendacho moyo ni dawa, (What the heart desires is like medicine to it) ***source;*** *Mutere, M. (2015)*

Description: This saying emphasizes the nourishing qualities of love and emotional fulfillment. Just as medicine is beneficial for physical well-being, fulfilling the desires of the heart, particularly in the context of love and emotional connections, contributes to one's overall happiness, contentment and well-being.

Reference

Plate 4.26 shows a Samburu man and woman holding hands. Plate 4.27 shows a sculpture of abstract human figures embracing one another.

Plate 4.26: Project 8, reference

Source: youtube.com

Plate 4.27: Project 8, reference

Source: amazon.ca

A sketch of love portrayed using an abstract Samburu male and female human figure (Plate 4.28). Side and front view (Plate 4.29).

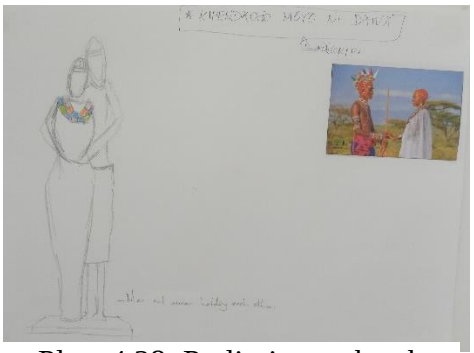


Plate 4.28: Preliminary sketch

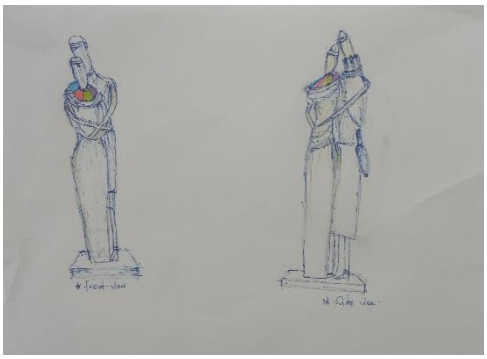


Plate 4.29: Developed sketch

Project 9.

Swahili inscription: Ukipenda, penda chako, (If you love, love what is yours) ***source;*** *Mutere, M. (2015)*

Description: The phrase "Ukipenda, penda chako" conveys the importance of appreciating and valuing people or aspects of life that belong to you. It encourages a sense of contentment and gratitude for what one already has emphasizing the idea that genuine love and fulfilment can be found within one's existing circumstances and relationships.

Reference

Plate 4.30 shows a squirrel and 4.31 shows a squirrel carrying her young one.

Plate 4.30: Project 9, reference

Source: www.animalplanet.com

Plate 4.31: Project 9, reference

Source: www.animalplanet.com

A sketch of love portrayed using a squirrel carrying her young one (Plate 4.32). Side and back view (Plate 4.33).

Plate 4.32: Preliminary sketch

Plate 4.33: Developed sketch

Project 10.

Swahili inscription: Niletee maua ningali hai, (Bring me flowers while I am still alive.) ***source;*** *Mutere, M. (2015)*

Description: This describes the importance of expressing appreciation to someone while they are still alive and able to appreciate it. It emphasizes the value of recognizing and honoring people's contribution and presence while they are still part of our lives.

Reference.

Plate 4.34: Project 10, reference

Source: starkpack.com

A preliminary sketch portraying kindness using a two birds (Plate 4.35). Front and side view (Plate 4.36).

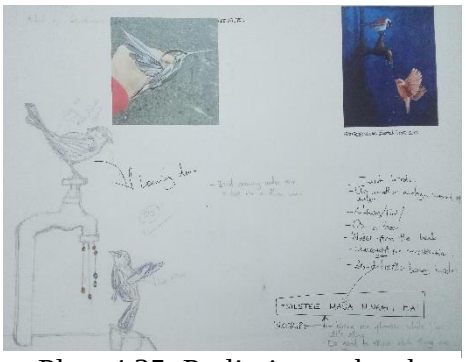


Plate 4.35: Preliminary sketch

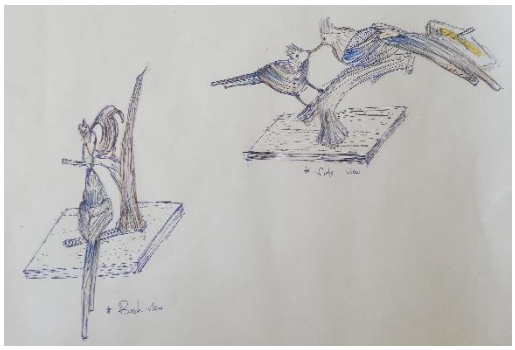


Plate 4.36: Developed sketch

Project 11.

Swahili inscription: Wema hauozi, (Good deeds never go bad) ***source;*** *Mutere, M. (2015)*

Description: This saying addresses the notion that acts of kindness and generosity, and their goodness will endure over time. It also suggests that the impact of good deeds last and can create a ripple effect, contributing to a cycle of positivity. In essence, the saying encourages individuals to have faith in persistent power of goodness, highlighting the belief that choosing what is right will ultimately lead to positive outcomes and a better world.

Reference.

Plate 4.37: Project 11, reference

Source: rd.com

Plate 4.38: Project 11, reference

Source: grangettos.com

A preliminary sketch portraying acts of giving illustrated using praying mantis (Plate 4.39). Front and side view (Plate 4.40).

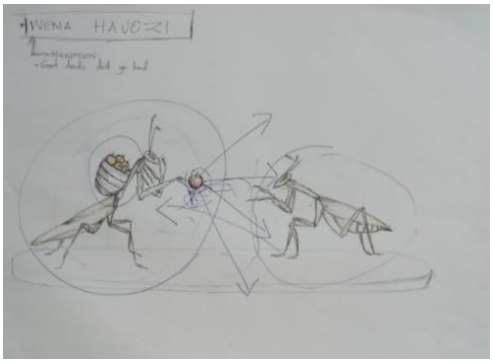


Plate 4.39: Preliminary sketch

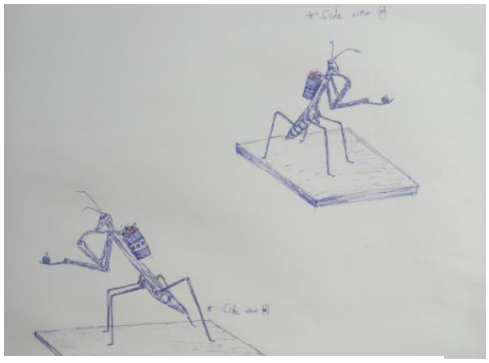


Plate 4.40: Developed sketch

Project 12.

Swahili inscription: Adui aangukapo mnyanyue, (When your enemy falls, lift him/her up.) ***source;*** *Mutere, M. (2015)*

Description: The proverb describes the idea of showing compassion and mercy even towards those who may have been enemies or opponents. It encourages the act of extending a helping hand and offering support. The underlying message is that kindness and understanding can foster reconciliation and contribute to a more harmonious and compassionate society.

Reference.

A a photo of a soldier lifting another one (Plate 4.41). A Turkana and Samburu warrior (Plate 4.42).

Plate 4.41: Project 12, reference

Source: www.pinterest.com

Plate 4.42: Project 12, reference

Source: www.alamy.com & www.stocksy.com

A preliminary sketch portraying acts of kindness illustrated using a Turkana warrior lifting a Samburu warrior (Plate 4.43). Side and back view (Plate 4.44).

Plate 4.43: Preliminary sketch

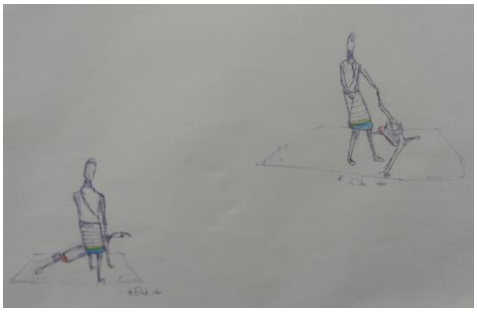


Plate 4.44: Developed sketch

Project 13.

Swahili inscription: Atakaye hachoki, (One who craves for something does not get tired) ***source;*** *Ali. H, O., & Ali. K, O. (2004)*

Description: This saying highlights the importance of perseverance and determination in achieving one's goal. It encourages the idea that strong desires or a genuine passion for something fuels the motivation to keep going. It also implies that when someone truly wants to achieve a goal, they will not easily abandon their efforts but rather continue working towards it with persistence and resilience.

Reference.

Bees on a honeycomb.

Plate 4.45: Project 13, reference

Source: www.beecleansoaps.co.uk

Bees are known to be hardworking insects whereby they are always busy and a preliminary sketch of the bees illustrating hard work on plate 4.46. Side and aerial view (Plate 4.47 and Plate 4.48).

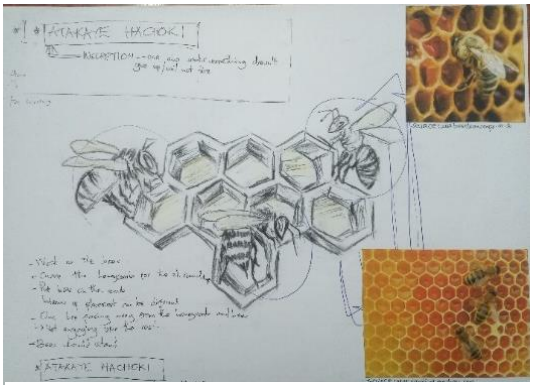


Plate 4.46: Preliminary sketch

Plate 4.47: Developed sketch

Plate 4.48: Developed sketch

Project 14.

Swahili inscription: Achanikaye kwenye mpini hafi njaa, (A hardworking person will reap the fruits of his productivity) ***source;*** *Mutere, M. (2015)*

Description: This saying conveys the idea that diligence, effort and productiveness are likely to lead to positive outcomes and success. It emphasizes the connection between hard work and the eventual rewards or benefits that come from it. It also highlights the value of dedication and the belief that continuous effort is often the key factor in achieving success.

Reference.

An ant carrying food.

Plate 4.49: Project 14, reference
Source: istockphoto.com

Plate 4.50 shows a sketch illustrating an ant carrying food. Front and back view (Plate 4.51).

Plate 4.50: Preliminary sketch

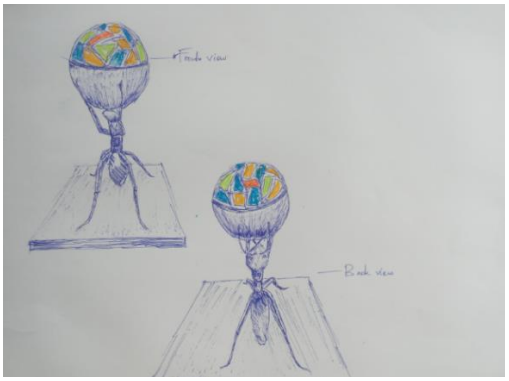


Plate 4.51: Developed sketch

Project 15.

Swahili inscription: Cha bure hakipatikani, (A thing for nothing is not obtainable)
source; *Mutere, M. (2015)*

Description: This saying defines the idea that one cannot expect to receive something for nothing. It also suggests that everything comes with a cost and there are no free or effortless gains in life. This saying is a reminder that most valuable things require effort or sacrifice, whether it be time, energy or resources.

Reference.

Plate 4.52 Project 15, reference

Source: boshez.wordpress.com

Plate 4.53: Project 15, reference

Source: www.alamy.com

Plate 4.54 shows a preliminary sketch of a man pulling a mkokoteni. This illustrates one toiling and working as the effort put in pulling a mkokoteni shows that nothing is for free. Front, side and back view (Plate 4.55).

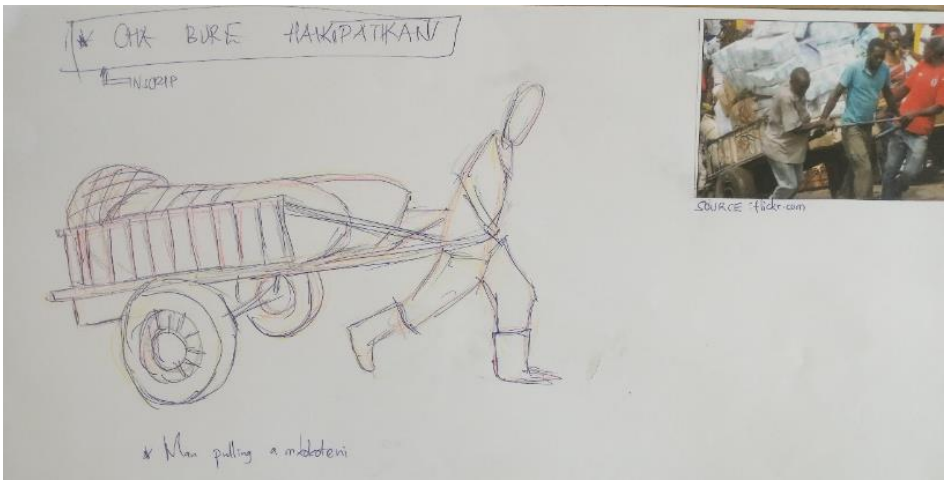


Plate 4.54: Preliminary sketch

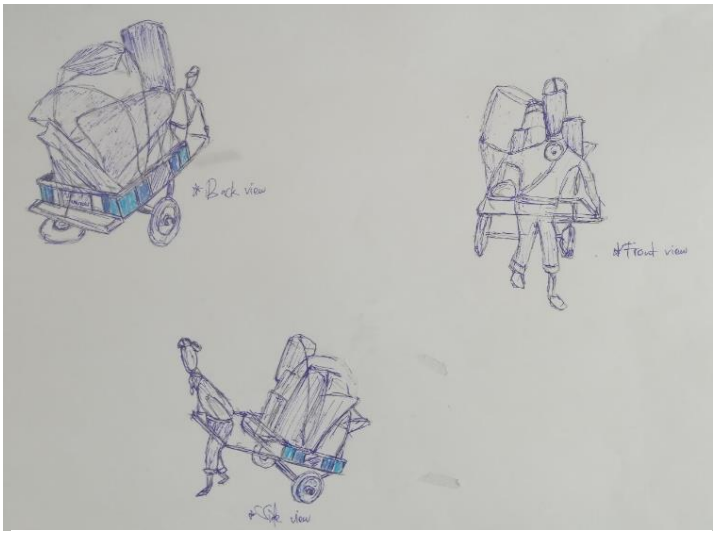


Plate 4.55: Developed sketch

Project 16.

Swahili inscription: Jogoo wa shamba hawiki mjini, (A village rooster does not crow while in town. It means that some things only fit in some environments) ***source;*** *Ali. H, O., & Ali. K, O. (2004)*

Description: The proverb conveys the notion that certain things are best suited and ore more effective in specific environments or situations and emphasizes the importance of compatibility and appropriateness. This proverb encourages a thoughtful consideration of the match between attributes and environment, emphasizing the need to tailor or adapt things to fit particular situations for the best outcome.

a) Reference

Plate 4.56: Project 16, reference

Source: pinterest.com

A preliminary sketch of two roosters was done to portray dominance (Plate 4.57). Front and back view (Plate 4.58).

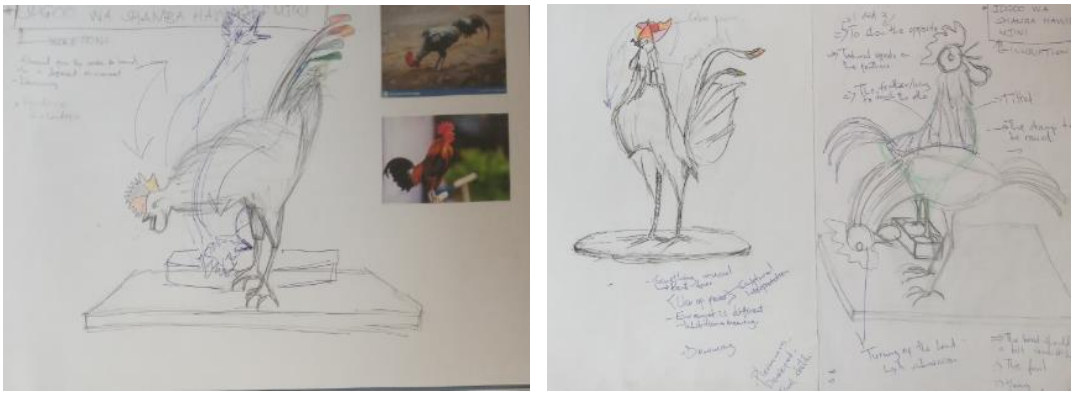


Plate 4.57: Preliminary sketch

Plate 4.58: Developed sketch

Project 17.

Swahili inscription: Mwana wa mbuzi hufagia alalapo, (A kid of a goat sweeps where it sleeps) ***source;*** *Mutere, M. (2015)*

Description: This proverb conveys a cautionary message about the potential consequences of neglect and carelessness. It suggests that individuals should be mindful of their surroundings and take care of their immediate environment, especially where they reside or spend significant amount of time.

Reference.

Dung beetles pushing dung.

Plate 4.59: Project 17, reference

Source: www.animals.sandiegozoo.org

A sketch illustrating a dung beetle pushing dung, to portray cautiousness (Plate 4.60). Front and side view (Plate 4.61).

Plate 4.60: Preliminary sketch

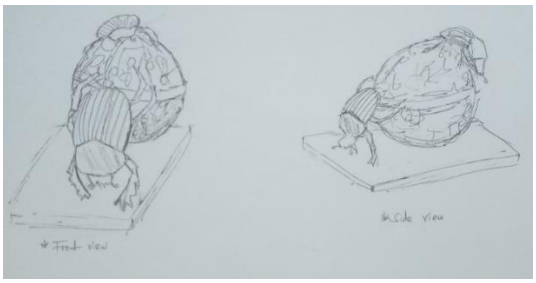


Plate 4.61: Developed sketch

Project 18.

Swahili inscription: Chachu kidogo huumua, (A little yeast raises the loaf) ***source;*** *Mutere, M. (2015)*

Description: This proverbs conveys a cautionary message about the potential destructive power of minor issues. It suggests that neglecting or underestimating small problems can lead to much larger and more serious consequences.

Reference.

A swarm of locusts destroying a plant.

Plate 4.62: Project 18, reference

Source: www.foodunfolded.com

A sketch illustrating a swarm of locusts destroying plants (Plate 4.63). Front, side and back view (Plate 4.64).

Plate 4.63: Preliminary sketch

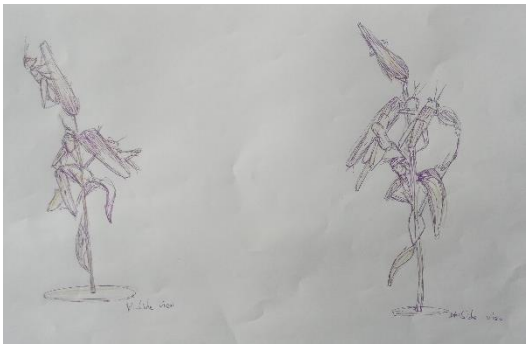


Plate 4.64: Developed sketch

Project 19.

Swahili inscription: Subira huvuta heri, (Patience attracts blessings as it brings close what is far away and makes difficult things possible) ***source;*** *Mutere, M. (2015)*

Description: This proverb conveys the idea that exercising patience and perseverance during challenges or difficulties eventually leads to positive results or rewards. It emphasizes the virtue of waiting calmly and persistently for the desired result instead of seeking instant satisfaction or giving in to impatience. The proverb encourages individuals to resist the temptation of rushing or abandoning their pursuits. Instead they increase their chances of reaping the benefits of their efforts by remaining patient.

Reference.

A Venus fly trap catching a house fly.

Plate 4.65: Project 19, reference

Source: pinterest.com

A sketch illustrating a Venus fly trap catching a housefly (Plate 4.66). Front, side and back view (Plate 4.67).

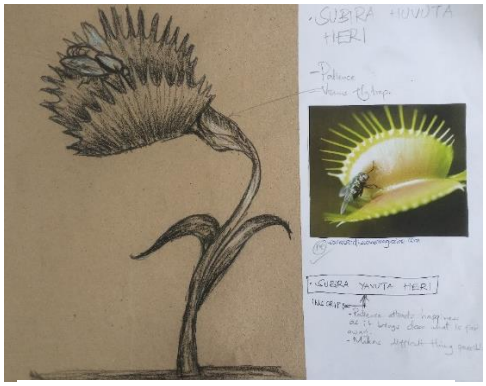


Plate 4.66: Preliminary sketch

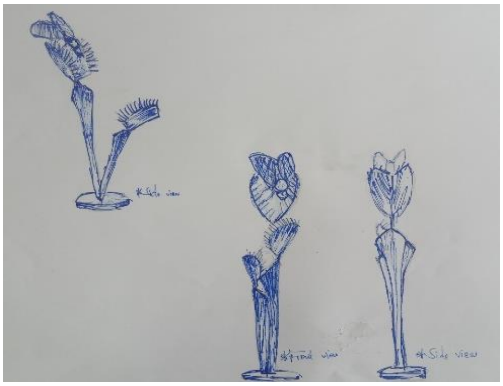


Plate 4.67: Developed sketch

Project 20.

Swahili inscription: Mvumlivu hula mbivu, (A patient person eats ripe fruits), ***source;*** *Oswald et al. (2014)*

Description: This proverb highlights the virtue of patience and the rewards that come with a calm and composed demeanor. “Ripe fruits” symbolize the positive outcomes, achievements or rewards that result from waiting and persevering through challenges. This proverb encourages individuals to trust the process and understand that delayed gratification can lead to more fulfilling and successful results in the end.

Reference.

A pelican catching fish.

Plate 4.68: Project 20, reference

Source: www.animalshowstuffworks.com

A sketch illustrating a pelican catching fish (Plate 4.69). Side, front and back view (Plate 4.70).

Plate 4.69: Preliminary sketch

Plate 4.70: Developed sketch

Project 21.

Swahili inscription: Aendaye pole pole hana budi afike, (One who walks with calm and care will arrive without fail) ***source;*** *Mutere, M. (2015*

Description: This proverb describes the importance to prioritize mindfulness and patience in their endeavors, suggesting that success often comes to those who navigate their paths with a measured and careful stride.

Reference.

A tortoise carrying her young ones.

Plate 4.71: Project 21, reference

Source: www.dailymail.co.uk

A sketch illustrating a tortoise carrying her young ones to portray patience (Plate 4.72). Side, front and back view (Plate 4.73).

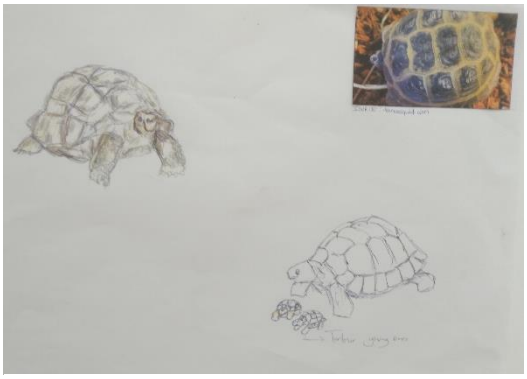


Plate 4.72: Preliminary sketch

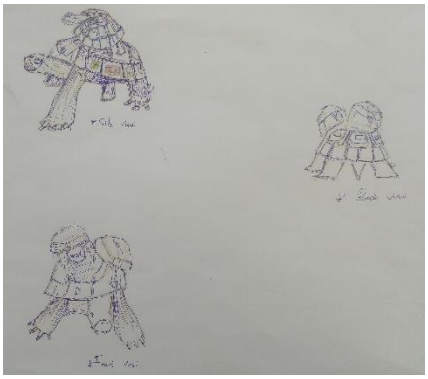


Plate 4.73: Developed sketch

Project 22.

Swahili inscription: Dunia huleta vyema na vimbi, (The world brings both good and evil things) ***source;*** *Mutere, M. (2015)*

Description: This saying describes that life is a mixture of positive and negative experiences. It encourages a realistic perspective on life, acknowledging that challenges and difficulties are inevitable.

Reference.

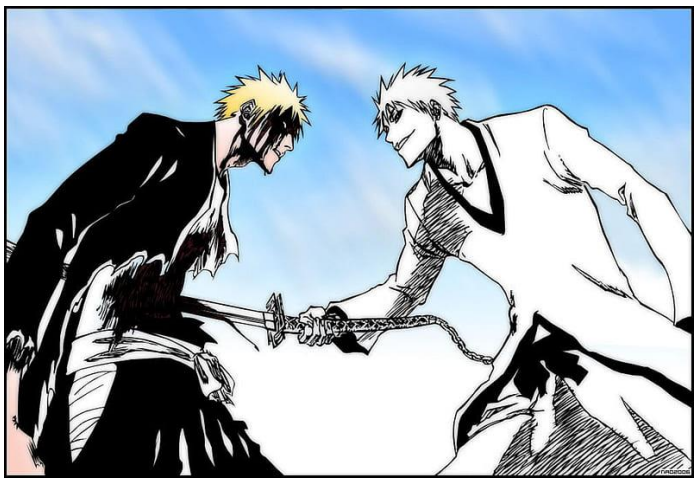


Plate 4.74: Project 21, reference

Source: dailyanimeart.com

A sketch illustrating a tortoise carrying her young ones to portray patience (Plate 4.75). Side, front and back view (Plate 4.76).

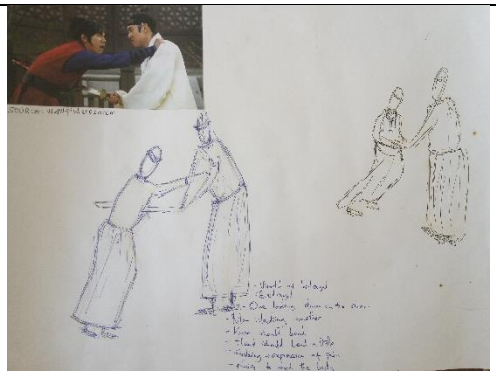


Plate 4.75: Preliminary sketch

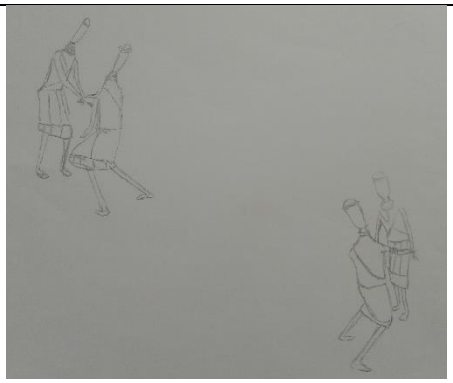


Plate 4.76: Developed sketch

Project 23.

Swahili inscription: Ulimwengu hauna siri, (The world has no secrets) ***source;*** *Mutere, M. (2015)*

Description: This saying conveys the idea that everything is ultimately knowable or discoverable. It implies that there are no hidden truths or mysteries that cannot be unraveled with the right knowledge, exploration or investigation. It further emphasizes the idea that there are no secrets, and that what may seem hidden at one point can be uncovered with time, persistence or the right approach.

Reference.

Plate 4.77: Project 23, reference

Source: www.huffpost.com

Plate 4.78: Project 23, reference

Source: worldatlas.com

Plate 4.79 shows a sketch of the chameleon with the binoculars was used to portray how nothing in the world can be hidden. (Plate 4.80).

Plate 4.79: Preliminary sketch

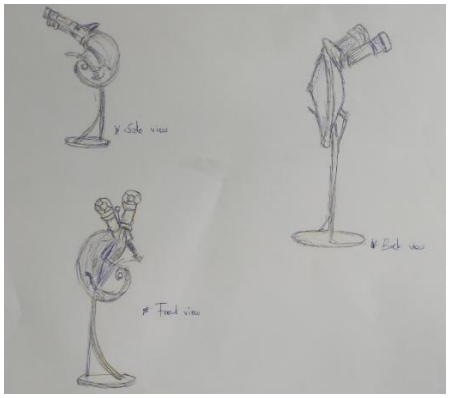


Plate 4.80: Developed sketch

Project 24.

Swahili inscription: Dunia ni mwendo wa ngisi, (The world moves like a squid/octopus) ***source;*** *Mutere, M. (2015)*

Description: This proverb conveys the idea that the ways of the world are unpredictable. It suggests that life is full of uncertainties and surprises and one cannot always predict how things unfold. It highlights the importance of adaptability and resilience in the face of unforeseen challenges and despite our best efforts as individuals to plan and control our lives, there will always be elements of uncertainty and unpredictability.

a) Reference

Plate 4.81: Project 24, reference

Source: www.visitsealife.com

A sketch of an octopus was used to depict the ways of the world and how unpredictable it is (Plate 4.82). Side, front and back view (Plate 4.83).

Plate 4.82: Preliminary sketch

Plate 4.83: Developed sketch

4.3 Data presentation and analysis for objective three

The third objective was to determine through experimentation suitable joinery and finishing techniques for creation of sculptures for indoor public spaces. In Appendix B, Table 2 shows categorically the tests that were carried out in the experimentation of metal and glass.

4.3.1 Joinery techniques

The researcher used different joinery methods in metal and glass. This entailed welding, forging, bending and riveting in metal. Soldering, leading and use of silicon were used in the case of glass.

4.3.1.1 Welding

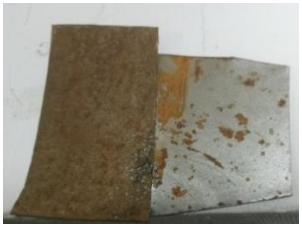
The researcher used arc welding technique using welding rods to join the metals together. This technique was applied on different types of metal sheet, expanded wire, perforated sheet, round bars, scrap metal, screws, round pipes, wires and square tubes. However not all metals could be welded as they contained aluminium. It was observed that higher temperatures of 250 amps burn the metal and lower temperatures of 50 amps do not join metal together. Moderate temperatures between 220 and 222 amps join metal together without destroying the metal sheet and wires. This property was later employed in the final thematic sculptures. Plate 4.83, 4.84 and 4.85 below shows the appearance of metal sheets after welding using different temperatures.

Welding temperature

Welded metal sheet

Plate 4.84: The metal sheet tears when welding on 250 amps

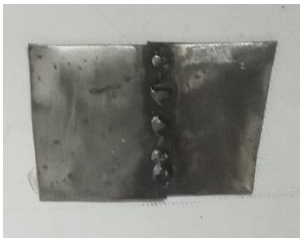
Welding temperature



Welded metal sheet

Plate 4.85: The metal sheets do not join when welding on 50 amps

Welding temperature



Welded metal sheet

Plate 4.86: The metal sheets join easily when welding on 222 amps

4.3.1.2 Forging

The researcher experimented with metal sheets of different gauges. Different sizes of hammers were used to shape metal into forms by hitting. It was observed that metal sheets of gauge 18, 20 and 22 were easier to forge compared to gauge 16 due to its thickness. Regarding this, the researcher utilised metal sheets of gauges 18, 20 and 22 in the creation of sculptural pieces and gauge 16 was used on the bases of the sculptures. Plate 4.86 shows the appearance of forged metal of different gauges.

Gauge 16

Gauge 18

Gauge 22

Plate 4.87: Forging on different metal sheet gauges

4.3.1.3 Bending

The researcher used different tools and techniques in bending such as use of hands, pliers, vice and hammer. This technique was applied in materials such as wires, round bars, round pipes and metal sheet. It was observed that the strength of materials determined the bending technique to use and achieve the desired bends. Wires were easily bent using pliers, round bars and pipes were bent using a vice and hammer while metal sheets were bent using hands or pliers. It was also observed that some round bars and pipes had to be cut using a cutting disc first to ease the process of bending using vice and hammer due to the thickness. Plate 4.87 below shows the appearance of different materials using the bending method.

Metal sheet (Use of hands)

Wire (Use of pliers)

Round bar and round pipe (Use of vice and hammer)

Plate 4.88: Different materials using bending method

4.3.1.4 Riveting

The researcher used different rivet sizes on tin and black metal sheet to join metal together. A drill was used to make holes on the riveted areas on metal and a riveting gun was used insert rivets into the holes and fasten the metal pieces together. The rivet gun took 6 to 10 seconds to fasten tin sheets together while it took 5 to 7 seconds for the rivet gun to fasten tin sheet and black metal sheet together. Once the rivet head joins the metal together, the lower part of the rivet known as the mandrel comes off. Plate 4.88 shows the appearance of riveting method on tin sheet and black sheet metal.

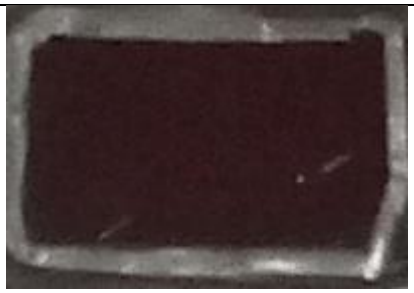
Riveted tin sheet

Riveted metal sheet

Plate 4.89: The riveting method on tin sheet and black sheet metal

4.3.1.5 Soldering

The researcher used soldering technique in joining glass and metal. The soldering technique entailed the use of a solder, copper foil, flux and a soldering iron. Once the glass piece was cut, it was later grinded using a glass grinding machine to smoothen the edges. The glass edges were wrapped using the copper foil to aid in the use applying solder on the foiled glass and areas for joining it on metal. Plate 4.89 shows soldered glass and soldered glass on metal.

 Soldered stained glass	 Soldered stained glass on metal
Plate 4.90: Soldered glass and soldered glass on metal	

4.3.1.6 Leading

Leading technique entailed the use of lead strips, solder, flux and a soldering iron. The lead strips were then straightened and cut to pieces using a lead knife for the glass to fit in. Small nails were used on the working surface to hold the lead and the glass firmly. Once the glass is intact, the nails were removed and flux was applied on different areas to aid in the use of a solder. Then it was later cleaned with patina and a brush to preserve and strengthen the glass. Plate 4.91 shows leaded stained glass.

Leaded glass

Plate 4.91: Stained glass joined using leading technique

4.3.1.7 Mosaic

The researcher experimented with different adhesives that is silicon and white cement paste in creating a mosaic. This entailed applying the adhesive on the glass pieces and placing on the metal. Depending on the surface area, when the metal surface is bigger the adhesive is spread on it and glass is placed afterwards. Silicon takes 5 to 15 minutes to attach on metal while cement paste takes 2 to 4 minutes to attach on metal which is relatively fast than silicon. It was observed that white cement paste was no a strong

adhesive as glass pieces were falling off despite it attaching quicker than silicon. For a strong bond on metal, silicon was used as an adhesive in the creation of the final sculptures. Plate 4.92 below shows use of different adhesives.

Use of silicon

Plate 4. 92: Glass mosaic using different adhesives

4.3.2 Finishing techniques

The finishing methods that were employed this study application of lacquer, painting, texturing, polishing, rust and smoke.

4.3.2.1 Lacquer application

The use of brush and spray gun was used in lacquer application. Clear lacquer was thinned using a standard thinner. 1 to 3 coats were applied on the metal. This was done to determine the finish of the metal. It was observed that the first coat did not give the metal a polished look until the third coat was applied. Lacquer takes 3 to 5 minutes to dry in open air and 5 to 12 minutes in an enclosed space. Plate 4.93 below shows the appearance of lacquer application on metal.

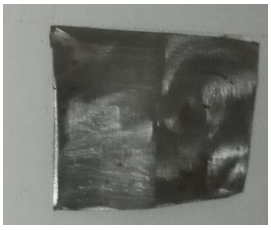
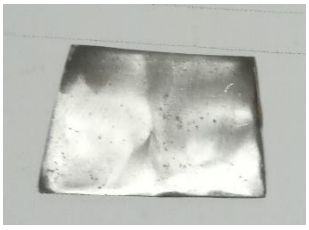
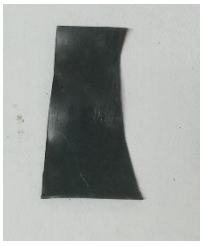
		
1 layer	2 layers	3 layers

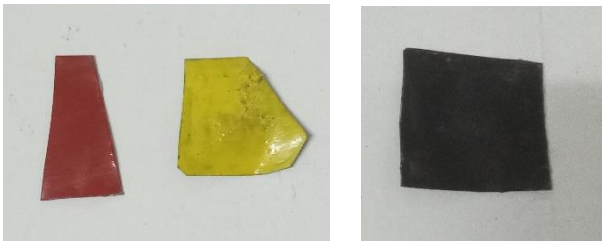
Plate 4.93: The appearance of lacquer application on metal

4.3.2.2 Painting

The researcher applied automotive paints using a brush tool and a spray gun. The paint was also thinned using a standard thinner. Once the first layer dried, another layer of paint was applied. This was done in the case of using a brush tool. While using a spray gun it was done once to avoid over layering and buildup of paint on metal. It was observed on each metal surface that the use of brush in application of paint for the first layer left some uneven brush strokes on the metal and some parts were not covered in paint evenly. The more layers applied, the even brush strokes appeared on each metal surface. However, the use of spray gun distributed the paint evenly whereby spraying was only done once. It takes 2 to 5 minutes to dry in open air and 4 to 10 minutes to dry in an enclosed space. For an even distribution of paint on metal, the use of a spray gun was selected for painting method of the final sculptures. Plate 4.94 below shows the appearance of paints on metal.



Use of a spray gun

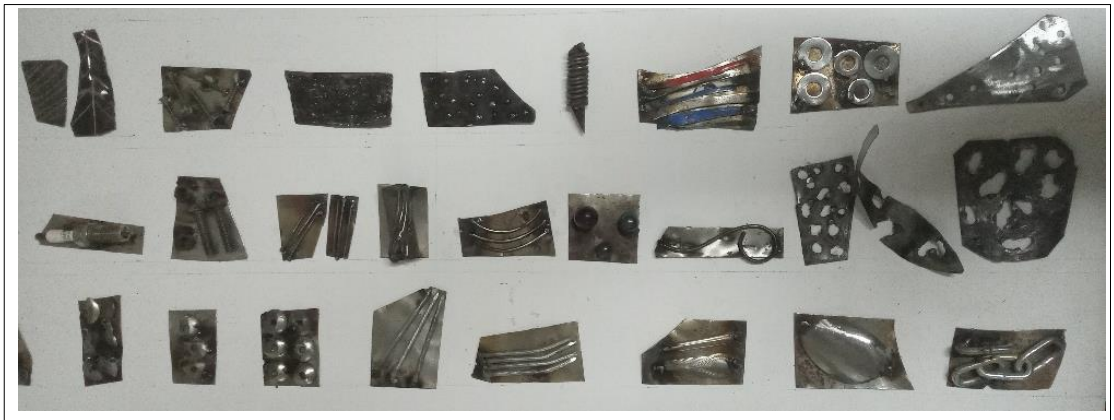


Use of a brush

Plate 4.94: The appearance of paints on metal

4.3.2.3 Texturing

The researcher tried a variety of metal materials which included spanners, nails, roofing nails, different types of wires, spoons, forks, bearing balls, screws, washers, roller chain and scrap metals. It was also observed that welding rods also applied a variety of textures on metal surfaces when melted. The materials were used to achieve different textural effects on the final sculptures. Plate 4.95 below shows the different metal materials used to achieve variety of textures.

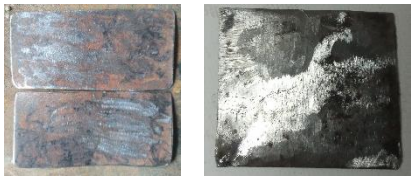


Variety of textures using different metal materials

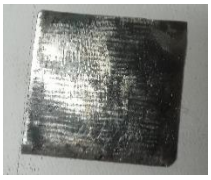
Plate 4.95: Variety of textures using different metal materials

4.3.2.4 Polishing

The researcher used different polishing discs to achieve a smooth finish on metal. This was done by using a flapping disc, grinding disc and sand paper. The grinding disc was first used to smoothen out a weld, grind through metal edges and metal surfaces and also remove rust. The flapping disk provided precise blending and finish depending on the finish the researcher wanted to achieve. The sand paper was finally used to obtain a very optimal finish without compromising the surface of metal and this was done using an angle grinder. Plate 4.96 below shows the different finishes using various polishing discs.



Use of grinding disc



Use of flapping disc

Use of sandpaper

Plate 4.96: Different finishes using various polishing discs

4.3.2.5 Rust

Rust was achieved through various methods. Some metals had rusted naturally. The researcher experimented on methods like placing metal sheets on the rain, use of salt and water and naturally rusted metal on rain water where they were left over night for the rusting process. This methods were also applied on other metal materials and scrap metal. It was observed that metal sheets, scrap metal, round bars and pipes and square tubes achieved the rust effect easily unlike spoons and forks which hardly achieved the

rust effect. It is when the researcher grinded he spoons and forks and applied the rust methods where they had the rust effect. This was then applied as a finishing technique in the creation of thematic sculptures. Plate 4.97 below shows various rust methods.

Natural rust

Natural rust and rain water

Salt and water

Natural rust and rain water

Plate 4.97: Different rust methods

4.3.2.6 Smoke

The researcher applied the use of smoke on metal to form soot on the metals surface. This was done by the use of lubricated metal sheet where it was burnt using paper for 4 to 6 hours to form soot on metal. Plate 4.98 below shows the use of smoke on metal.

Use of smoke

Plate 4.98: Use of smoke on metal

4.3.2.7 Heat

The researcher applied the use of heat on metal where the flame is slowly and evenly done until it changes color. Patina was also applied on metal to make the surface darker when heating the metal. The process of changing color takes 15 seconds to 1 minute depending on the intensity of color on metal. Plate 4.99 below shows the appearance of heating method on metal.

Use of heat
Plate 4.99 Use of heat on metal

4.4 Data presentation and analysis for objective four

Objective four applied joinery and finishing test results in the creation of indoor sculptures using metal and glass inspired by selected Swahili Kanga inscriptions. Each project encompasses the following:

a) Final drawings

Final drawings were more refined, showed more details and aided in the preparation for the Marquette.

a) Marquette

A Marquette, a scale model, was created using metal to explore the refinement of the final sculpture. The scale model showcased detailing of different textures, joining and finishing techniques. The Marquette also served as a foundation for the researcher to experiment with different poses and expressions and aid in refining the developed ideas and evaluate proportions before creating the large scale final sculpture.

b) Final sculpture

After the creation of the Marquette, techniques such as welding, bending and forging to create intricate shapes, forms and details. Soldering and use of silicon were

techniques used in the case of glass. Finishing techniques such as polishing, painting and application of lacquer were applied to achieve various textures, colors and surface finishes contributing to structural aspects aesthetics of the final sculpture. Both abstract and realistic styles were applied to visually illustrate the sculptural compositions.

Project 1. Kidole kimoja hakivunji chawa

Plate 4.100 shows a drawing that was more refined and shows more details. In Plate 4.101, the Marquette was created.

Plate 4.100: Project 1, final drawing

Plate 4.101: Project 1, Marquette

Medium	Metal
Technique	Welding
Size	H- 21.9 cm, W-86.7 cm, D- 14.1 cm

Final sculpture.

Plate 4.102: Project 1, final sculpture

Medium	Metal and glass
Technique	Welding, leading, polishing and lacquer application.
Size	H-79 cm, W- 274cm, D- 31cm
Description	The techniques that were applied in this piece were welding, bending and forging. The abdomen of the ants were forged using a hammer. Round pipes and bars were welded together to create the legs. Galvanized wires were welded on the head to form the antennae. Metal sheet was bent and folded to create a circular shape to form the food the ants are holding. An expanded metal was welded on the circular metal forms and later the leading technique was used to join the glass pieces on to the metal. Polishing and application of lacquer were applied as the finishing technique.
Visual representation/analogy	This sculpture shows that each ant is playing a crucial role by completing a task through coordination as it demonstrates unity. It teaches us that unity enables us to accomplish tasks by working together towards common objectives.

Project 2. Ondoka twende

Final drawing and Marquette.

Plate 4.103: Project 2, final drawing

Plate 4.104: Project 2, Marquette

Medium	Metal
Technique	Welding, rust, painting
Size	H- 11.9 cm, W-53.8 cm, D- 13.3 cm

Final sculpture.

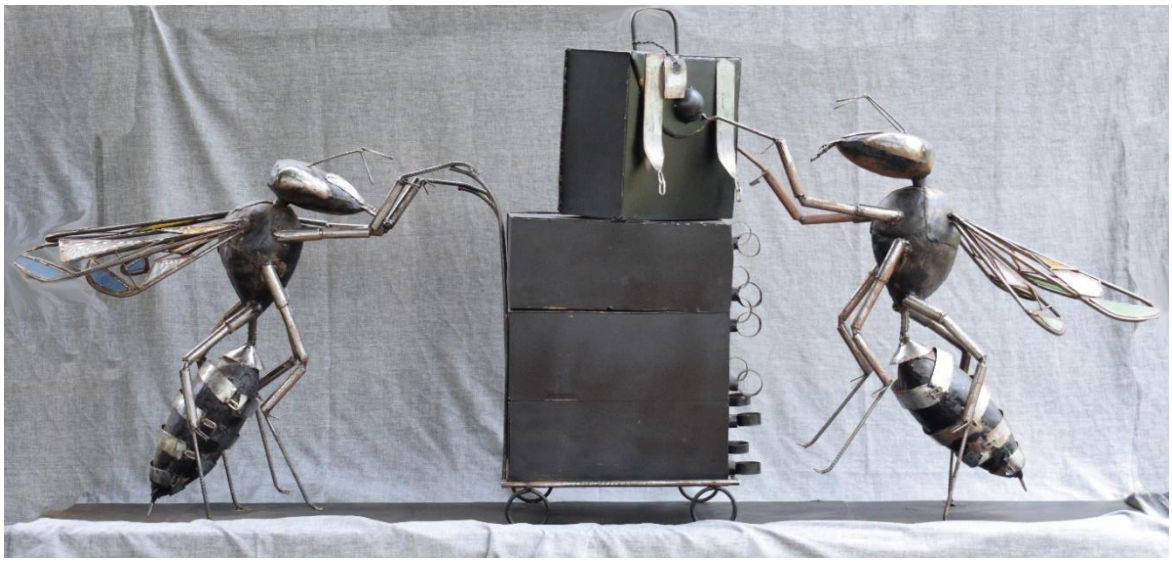


Plate 4.105: Project 2, final sculpture

Medium	Metal and glass
Technique	Welding, soldering, painting, lacquer application.
Size	H-97 cm, W- 210 cm, D- 36cm
Description	The contrast of the sculpture was achieved by polishing and painting techniques where black paint was used to highlight the wasps and the luggage they are carrying. Stained and textured glass were soldered on the wasps' wings to add color.
Visual representation/analogy	The wasps in this piece serve as an example of unity and organization as they are collaborating in handling the luggage each contributing their strengths and skills. The sculpture symbolizes how working in harmony helps overcome obstacles and achieve success.

Project 3. Umoja ni nguvu

Final drawing and Marquette.

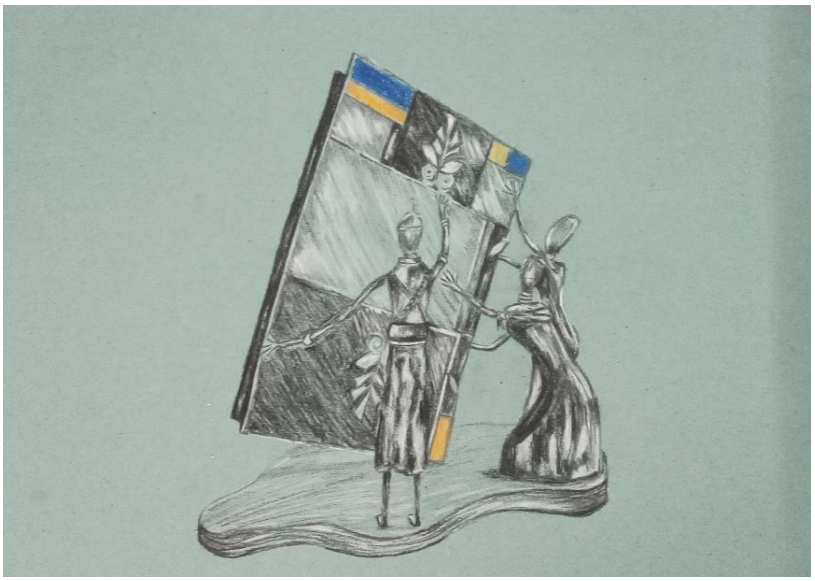


Plate 4.106: Project 3, final drawing

Plate 4.107: Project 3, Marquette

Medium	Metal
Technique	Welding
Size	H- 39.4 cm, W-48 cm, D- 13.7 cm

Final sculpture.

Plate 4.108: Project 3, final sculpture

Medium	Metal and glass
Technique	Welding, soldering, polishing, painting and lacquer application.
Size	H-86cm, W-80cm, D-56cm
Description	The patterns welded on the book were polished and welded on the painted areas of the book. Wires were used on the abstract human forms to create the Samburu and Turkana ornamentation. Stained and obscure glass were soldered on the book to add color on to the sculpture.
Visual representation/analogy	This sculpture describes the importance of gender equality and inclusivity in the pursuit of knowledge empowerment. This portrays education and knowledge empowerment is a societal role that both men and women should partake in.

Project 4. Changu chetu, chako chako

Final drawing and Marquette.

Plate 4.109: Project 4, final drawing

Plate 4.110: Project 4, Marquette

Medium	Metal
Technique	Welding
Size	H- 7 cm, W-69.4 cm, D- 15.5 cm

Final sculpture.

Plate 4.111: Project 4, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-30cm, W-123cm, D-25.5cm
Description	Spoons and forks were welded on the birds to create texture on the body and highlight the wings. Round textured bar was bent to form a worm where pieces of glass that comprised of warm colors were joined on it using silicon. Knives were welded to form the tail. The base of the sculpture was painted black.
Visual representation/analogy	This bird sculpture highlights the negative aspects of greed as each bird is solely focused on securing its own share of food. It highlights how people prioritize their own interest and are reluctant to engage in mutual co-operation or sharing.

Project 5. Pupa haliishi

Final drawing and Marquette.

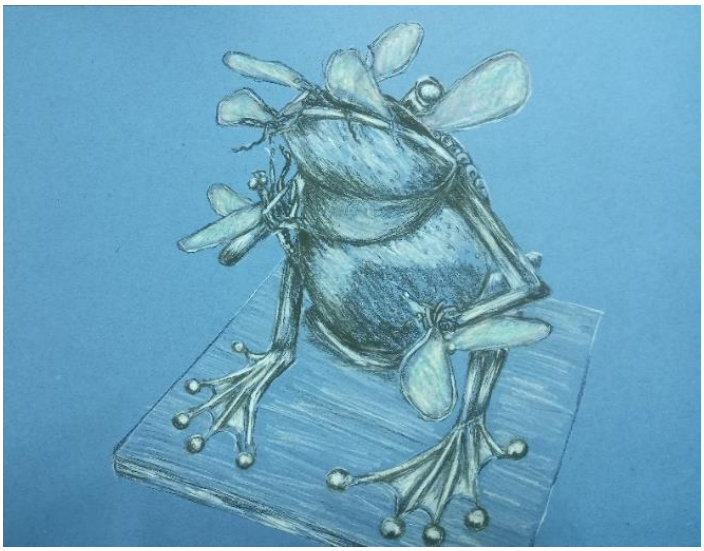


Plate 4.112: Project 5, final drawing

Plate 4.113: Project 5, Marquette

Medium	Metal
Technique	Welding
Size	H- 17.5 cm, W-20 cm, D- 21.6 cm

Final sculpture.

Plate 4.114: Project 5, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-40cm, W-43cm, D-25.5cm
Description	Round pipe was used to create the hands and legs. Washers were welded on the back of the body to create textural effect on the frog. Heated welding rod was used to create texture on the front part of the body. Spark plugs and nails were welded together to create the houseflies the frog is holding. Textured glass was cut out in the shape of wings for the housefly and silicon was used to join the glass on metal. Metal bearing balls were welded on the feet and painting and application of lacquer were applied.
Visual representation/analogy	The frog sculpture with a bulged stomach, flies in its mouth and hands portray greed. It highlights the idea of boundless desire for more and constantly seeking to consume more and more. The concept behind this is rooted in the observation that individuals who are consumed by greed are never content with what they possess and are always striving for more.

Project 6. Kichache hakikutoshi na kingi hakikulishi

Final drawing and Marquette.

Plate 4.115: Project 6, final drawing

Plate 4.116: Project 6, Marquette

Medium	Metal
Technique	Welding
Size	H- 28.4 cm, W-11.4cm, D- 8.7 cm

Final sculpture.

Plate 4.117: Project 6, final sculpture

Medium	Metal and glass
Technique	Welding, painting, silicon, lacquer application
Size	H-66.2 cm, W-23.5 cm, D-17.5 cm
Description	Washers were welded on the garment of the abstract human figure of the woman. Silicon was used to join glass on the galvanized wire and a one shilling coin was welded to form coins and sheet metal was cut in shapes to create a bunch of notes.
Visual representation/analogy	This sculpture portrays idea that greed is limitless. It suggests that someone who is driven by greed is never content, regardless of how much they have.

Project 7. Akipenda chongo huita kengeza

Final drawing and Marquette.

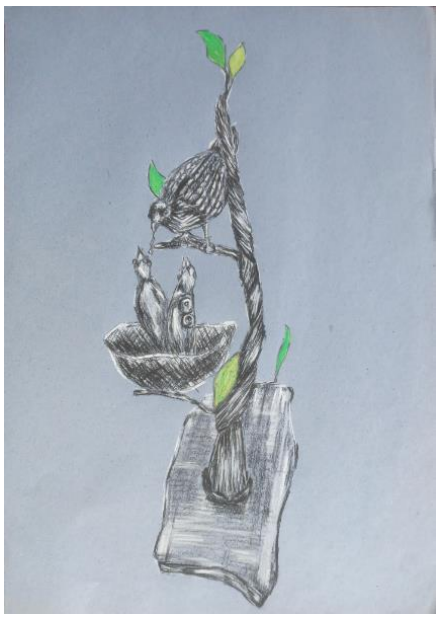


Plate 4.118: Project 7, final drawing

Plate 4.119: Project 7, Marquette

Medium	Metal
Technique	Welding
Size	H- 62.8cm, W-20 cm, D- 20.5 cm

Final sculpture.

Plate 4.120: Project 7, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-92 cm, W-57.2 cm, D-31 cm
Description	Galvanized wires were used to create the tree texture on the round pipe. Round bars were welded on the round pipe to create the tree branches. The bird used for this piece was a Speckled Pigeon. Scrap metal was welded to create the chest and abdomen of the bird. Cut out shape designs were welded together to create textural effect on feathers and tail.. Stained glass pieces were cut into leaf shapes, foiled and soldered on to the tree. Painting and polishing technique was applied and a wooden base was used.
Visual representation/analogy	This sculpture of the bird feeding her young ones portrays love on how she does not see the imperfections of her young ones but perceives only their innate worthiness of care and protection.

Project 8. Kipendacho moyo ni dawa

Final drawing and Marquette.

Plate 4.121: Project 8, final drawing

Plate 4.122: Project 8, Marquette

Medium	Metal
Technique	Welding
Size	H- 32 cm, W-9 cm, D- 5.3 cm

Final sculpture.

Plate 4.123: Project 8, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-50 cm, W-10.1 cm, D- 10.1 cm
Description	Glass pieces of different colors was used to create a mosaic on the abstract female figure, on the neckpiece and headgear. Scrap material and wires were welded on both figures to form create ornamentation. The sword was created from cut out metal sheet and scrap material.
Visual representation/analogy	This sculpture portrays a man and a woman embracing one another describes the nourishing qualities of love and emotional fulfillment.

Project 9. Ukipenda, penda chako

Final drawing and Marquette.

Plate 4.124: Project 9, final drawing

Plate 4.125 Project 9, Marquette

Medium	Metal
Technique	Welding and polishing
Size	H- 17.5 cm, W-21 cm, D- 6.2 cm

Final sculpture.

Plate 4.126: Project 9, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, texturing
Size	H-41.5 cm, W-29.5 cm, D-20.6 cm
Description	Thin pieces of metal sheet were cut and welded to create the texture on the squirrel sculpture. It was later painted and applied lacquer to achieve a shiny look. Stained and clear textured glass were soldered on the tail of the squirrels.
Visual representation/analogy	This sculpture of the squirrel carrying her young one reflects the essence of love yours and how it inspires us to cherish and embrace the relationships we hold dear to just as the squirrel cherishes her offspring.

Project 10. Niletee maua ningali hai

Final drawing and Marquette.

Plate 4.127: Project 10, final drawing

Plate 4.128: Project 10, Marquette

Medium	Metal
Technique	Welding
Size	H- 45 cm, W- 42.5 cm, D- 15 cm

Final sculpture.

Plate 4.129: Project 10, final sculpture

Medium	Metal and glass
Technique	Welding, glass beads, lacquer application
Size	H- 49.5 cm, W- 75.7 cm, D- 23.2 cm
Description	The bird used for this sculpture was a Speckled mouse bird. Hot welding rod formed the texture on the tree. Glass beads were used for the fruit. The tail was made from flat bar and texture using grooved lines. Round pipe was welded to achieve fallen branch of a tree.
Visual representation/analogy	This sculpture reminds us on the importance of extending kindness and helping others while they are still part of our lives just as the bird's gesture brings sustenance to its fellow creature.

Project 11. Wema hauozi

Final drawing and Marquette.

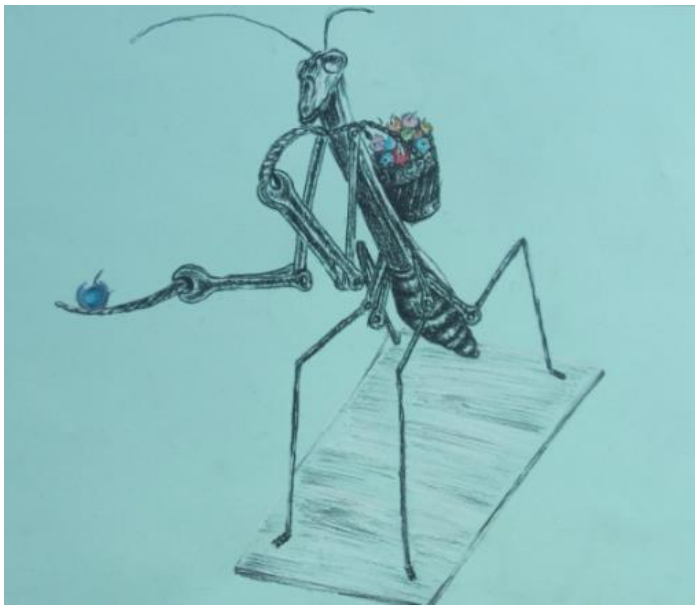


Plate 4.130: Project 11, final drawing

Plate 4.131: Project 11, Marquette

Medium	Metal
Technique	Welding
Size	H- 17.5 cm, W-33 cm, D- 30.7 cm

Final sculpture.

Plate 4.132: Project 11, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-69 cm, W-71 cm, D- 31.2 cm
Description	The sculpture was created using a metal square tube was used to create the body of the praying mantis. The abdomen was cut into pieces, forged and welded together. Use of round bars were welded to form the legs and a roller chain was welded to form the feet. Wire was welded on the head to create the antennae. Spanners were welded on the body to create the hands and key pieces were welded on to it to create texture. Wire was welded on the basket to create different pattern designs. Silicon was used to place the glass beads on the basket. Polishing, painting and lacquer application was applied as the finishing technique.
Visual representation/analogy	The praying mantis sculpture serves as a reminder that even the smallest acts of generosity can have a profound impact, enriching the lives of both the giver and the receiver.

Project 12. Adui aangukapo mnyanyue

Final drawing and Marquette.

Plate 4.133: Project 12, final drawing

Plate 4.134: Project 12, Marquette

Medium	Metal
Technique	Welding
Size	H- 32 cm, W- 10 cm, D- 5.5cm

Final sculpture.

Plate 4.135: Project 12, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-45.5 cm, W-37 cm, D-25.4cm
Description	Wires were welded vertically and horizontally to create a textural effect on the garments of the human figures. Glass was soldered at the bottom of the clothing. Scrap material was used to achieve the form of the traditional weapons and ornamentation of the Samburu and Turkana warriors.
Visual representation/analogy	This sculpture portrays the power of kindness as it shows that even in the face of enmity, there exists an opportunity for empathy.

Project 13. Atakaye hachoki

Final drawing and Marquette.

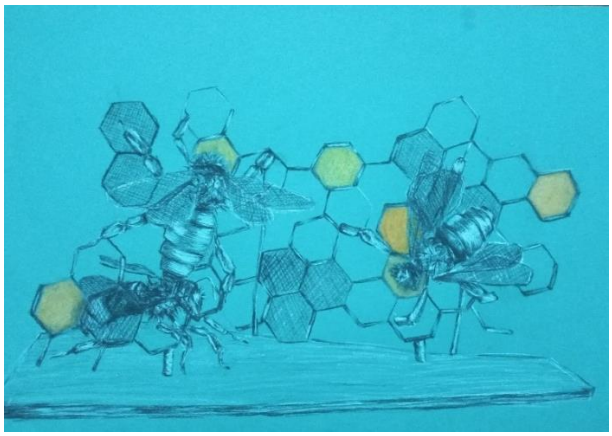


Plate 4.136: Project 13, final drawing

Plate 4.137: Project 13, Marquette

Medium	Metal
Technique	Welding
Size	H- 28 cm, W-19.7cm, D- 13 cm

Final sculpture.

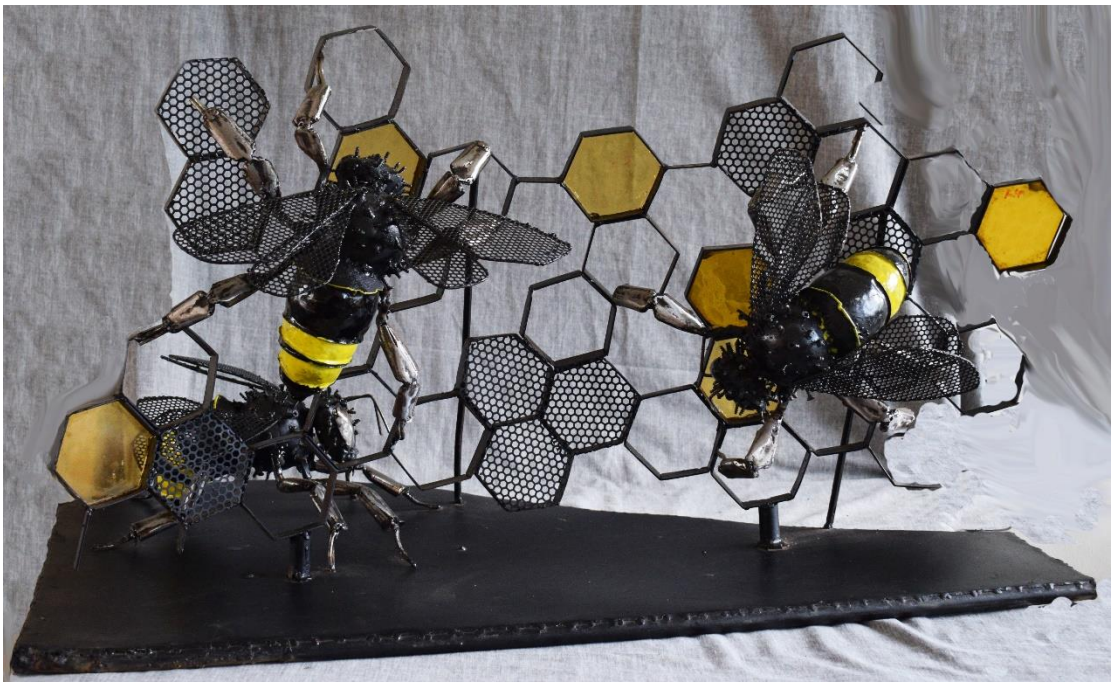


Plate 4.138: Project 13, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-55 cm, W-98 cm, D-40 cm
Description	Glass was soldered on the honeycomb. Perforated was welded on the honey comb as well as the bees wings. Black and yellow paint was used on the abdomen. The legs were polished and applied lacquer to achieve a smooth and shiny finish.
Visual representation/analogy	This sculpture of bees on the honeycomb serves as an analogy for the importance of hard work and rewards that come from dedication and perseverance.

Project 14. Achanikaye kwenye mpini hafii njaa

Final drawing and Marquette.

Plate 4.139: Project 14, final drawing

Plate 4.140: Project 14, Marquette

Medium	Metal
Technique	Welding
Size	H- 26 cm, W- 18 cm, D- 11.8 cm

Final sculpture.

Plate 4.141: Project 14, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H- 88.5 cm, W- 84 cm, D- 46.4 cm
Description	The fruit the ant sculpture is lifting was polished and glass pieces was soldered on it. Nails, bolts and nuts were welded on the abdomen to create texture. The ant sculpture applied the heat technique to give it color and lacquer was applied to achieve a glossy finish.
Visual representation/analogy	The ant carrying food sculpture serves as a symbol of hard work and the relentless pursuit of goals. It encourages us to embrace the spirit of productiveness knowing that through our efforts we can achieve so much.

Project 15. Cha bure hakipatikani

Final drawing and Marquette.

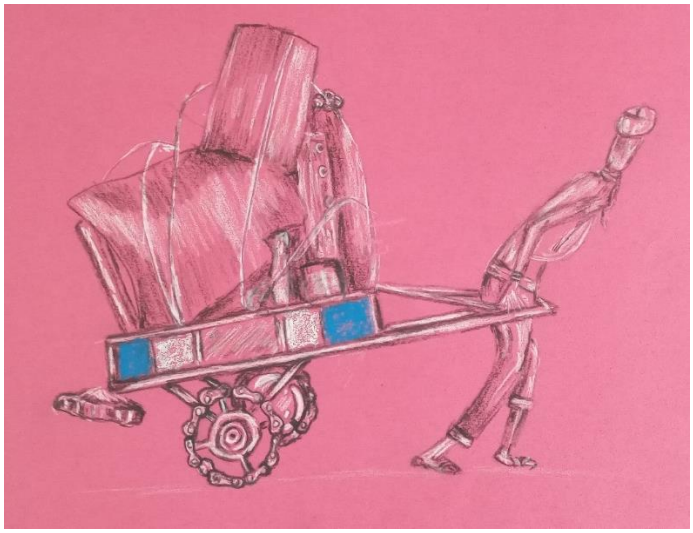


Plate 4.142: Project 15, final drawing

Plate 4.143: Project 15, Marquette

Medium	Metal
Technique	Welding
Size	H- 30 cm, W-27.5 cm, D- 15.2 cm

Final sculpture.

Plate 4.144: Project 15, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-35.3 cm, W-50 cm, D- 21 cm
Description	Round bars were welded together to create the mkokoteni. Roller chains were welded on scrap metal to create the wheels. Metal sheet was cut into different shapes, forged and welded to create the luggage. Riveting technique was used on tin sheet metal. Wire was welded on the luggage to resemble the rope that holds the luggage together. Metal ball bearings were welded on a luggage. Scrap materials were welded on to the human figure to create the Samburu men ornamentation. Polishing and lacquer application was used as the finishing technique.
Visual representation/analogy	The man pulling a mkokoteni sculpture describes that we must invest, time money or effort to accomplish our objectives. It also highlights that most things in life come with a price and nothing is for free.

Project 16. Jogoo wa shamba hawiki mjini

Final drawing and Marquette.

Plate 4.145: Project 16, final drawing

Plate 4.146: Project 16, Marquette

Medium	Metal
Technique	Welding
Size	H- 34 cm, W- 22 cm, D- 11.3 cm

Final sculpture.

Plate 4.147: Project 16, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-50 cm, W-53 cm, D- 32.3 cm
Description	Colored metal sheet was welded to create comb of the roosters. Cut out metal pieces were welded on the roosters body to create texture. Roofing nails were welded to create texture on the hackle. Metal sheet was cut, forged, polished and textured using a drill machine and hot welding rods for the wings. Red stained glass was soldered below the beak to form the wattle. Riveting was done to create the eyes. The flat bars were textured and glass was soldered on them to form the tail. Round textured bar was welded on the body to form the legs and feet. Painting, rust, use of smoke, polishing and lacquer application was applied for the finishing technique.
Visual representation/analogy	This sculpture of roosters explores dominance and subjugation and encourages a thoughtful consideration of the match between attributes and environment, emphasizing the need to tailor or adapt things to fit particular situations for the best outcome.

Project 17. Mwana wa mbuzi hufagia alalapo

Final drawing and Marquette.

Plate 4.148: Project 17, final drawing

Plate 4.149: Project 17, Marquette

Medium	Metal
Technique	Welding, painting, lacquer application
Size	H- 15 cm, W- 28 cm, D- 21.5 cm

Final sculpture.

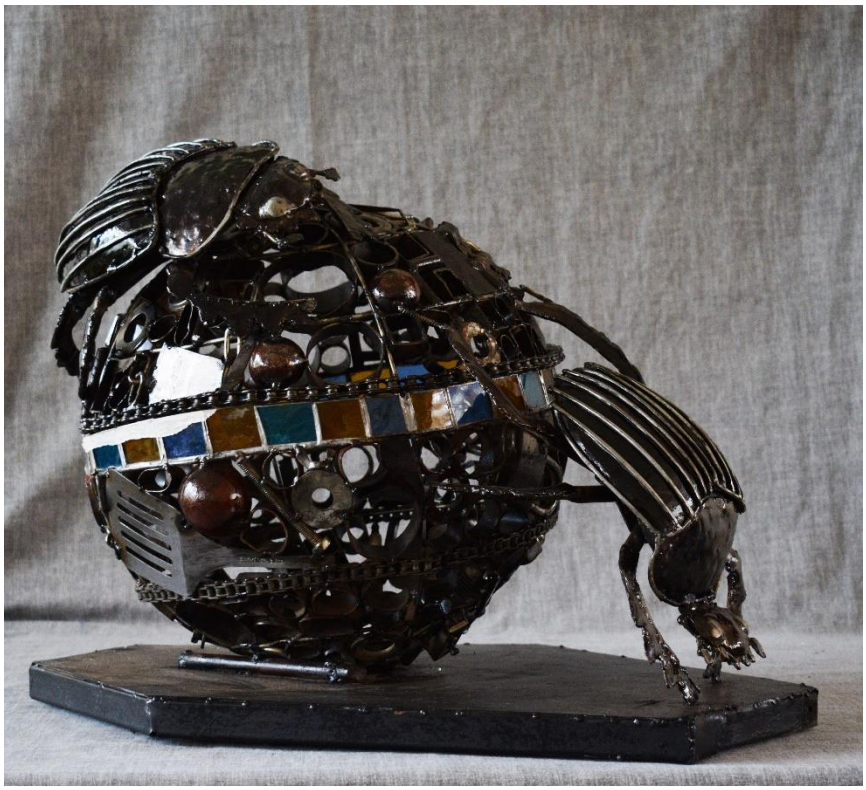


Plate 4.150: Project 17, final sculpture

Medium	Metal and glass
Technique	Welding, rust, painting, soldering, lacquer application
Size	H- 38 cm, W-56 cm, D- 39.8 cm
Description	Scrap material was used on the dung roll and glass was soldered around it. Galvanized wire was welded on the beetles' abdomen for contrast and textural purposes. Lacquer was applied on the sculpture to achieve a glossy finish.
Visual representation/analogy	The dung beetle sculpture serves as a cautionary message against taking our own possessions for granted. It suggests that individuals should be mindful of their surroundings and take care of their immediate environment, especially where they reside or spend significant amount of time.

Project 18. Chachu kidogo huumua mkate

Final drawing and Marquette.

Plate 4.151: Project 18, final drawing

Plate 4.152: Project 18, Marquette

Medium	Metal
Technique	Welding
Size	H-38 cm, W-20 cm, D- 9cm

Final sculpture.

Plate 4.153: Project 18, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-53 cm, W- 24.5 cm, D- 15 cm
Description	Hot welding rods created holes on the leaves to illustrate destruction. The locusts were polished and glass was soldered to form the wings. Perforated sheet was used on the millet plant and was put in rain water to achieve the rust effect. Lacquer was applied on the sculpture to attain a glossy finish.
Visual representation/analogy	This sculpture of a swarm of locust destroying a plant highlights that neglecting or underestimating small problems can lead to much larger and more serious consequences.

Project 19. Subira huvuta heri

Final drawing and Marquette.

Plate 4.154: Project 19, final drawing

Plate 4.155: Project 19, Marquette

Medium	Metal
Technique	Welding
Size	H- 22 cm, W-13.4 cm, D- 6.2 cm

Final sculpture.

Plate 4.156: Project 19, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H- 106.5 cm, W-44 cm, D- 22.3cm
Description	Metal sheet was shaped and welded to form the Venus fly trap. Screws were welded on the plant to form the teeth. Scrap metal was used in welding the body parts of the housefly. Both stained and textures glass were used on the wings and soldered on the housefly. The insectivorous plant was polished to create a smooth finish and lacquer was applied on the final piece.
Visual representation/analogy	The Venus fly trap sculpture teaches us that the most effective course of action is to wait patiently just as the insectivorous pant patiently waits for its meal to come within reach.

Project 20. Mvumilivu hula mbivu

Final drawing and Marquette.

Plate 4.157: Project 20, final drawing

Plate 4.158: Project 20, Marquette

Medium	Metal
Technique	Welding and polishing
Size	H- 27.5 cm, W- 17.4 cm, D- 7 cm

Final sculpture.

Plate 4.159: Project 20, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-48.5 cm, W- 22 cm, D- 16.5 cm
Description	Thin metal sheets were cut and welded on the pelican's body. Roofing nail caps were cut into half and welded on the fish to create texture. The sculpture was polished and Lacquer was applied and glass was later soldered.
Visual representation/analogy	The pelican sculpture reminds us the power found in stillness and patience where we can seize opportunities when they arise just like the pelican catches fish.

Project 21. Aendaye polepole hana budi afike

Final drawing and Marquette.

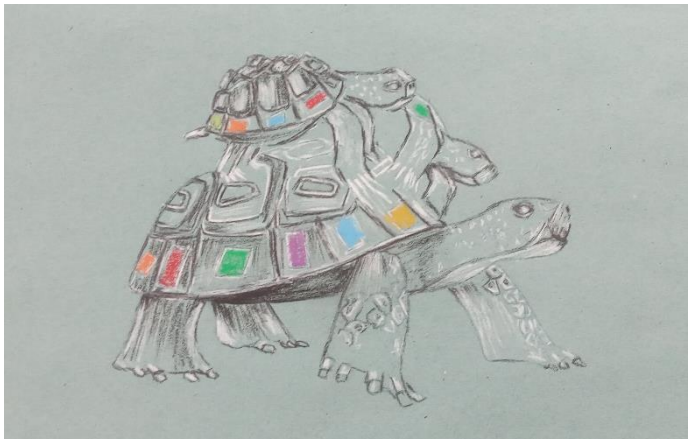


Plate 4.160: Project 21, final drawing

Plate 4.161: Project 21, Marquette

Medium	Metal
Technique	Welding
Size	H- 10 cm, W- 12.2 cm, D- 10.3 cm

Final sculpture.

Plate 4.162: Project 21, final sculpture

Medium	Metal and glass
Technique	Welding, painting, polishing , mosaic, lacquer application
Size	H- 27 cm, W-38.5cm, D- 28.5cm
Description	Wires and roofing nails were shaped into different shapes and size to create texture on the tortoises. Perforated sheet pieces were welded on the head for textural purposes. Smooth round bars were cut into pieces and welded on the toes. The tortoise' shells were painted and the sculpture was then applied lacquer to achieve a glossy finish.
Visual representation /analogy	The tortoise sculpture reminds us that we can achieve our goals through determination and patience even though our progress seems slow.

Project 22. Dunia huleta vyema na vimbi

Final drawing and Marquette.

Plate 4.163: Project 22, final drawing

Plate 4.164: Project 22, Marquette

Medium	Metal
Technique	Welding
Size	H- 32.2 cm, W- 12 cm, D- 7.7 cm

Final sculpture.

Plate 4.165: Project 22, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H- 41.5 cm, W- 24.8 cm, D-15.4 cm
Description	The sculpture applied polishing and painting techniques on the human figures. Glass was soldered on the attires. Wires were welded to create the ornamentation of the Samburu people.
Visual representation/analogy	The sculpture of a man stabbing the other illustrates the impact of betrayal on people and relationships.

Project 23. Ulimwengu hauna siri

Final drawing and Marquette.

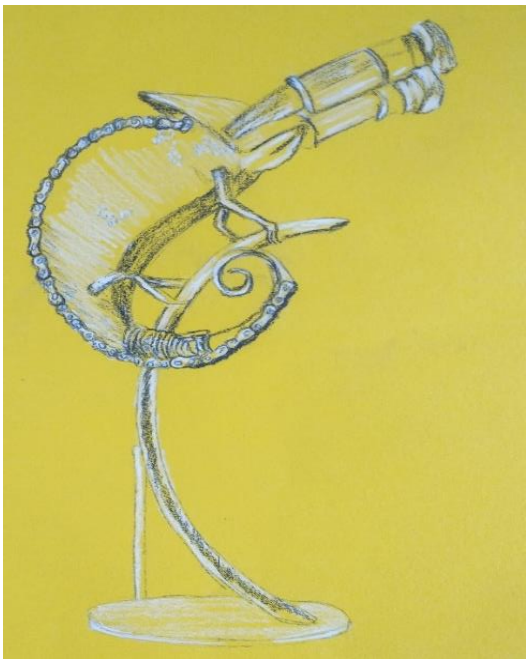


Plate 4.166: Project 23, final drawing

Plate 4.167: Project 22, Marquette

Medium	Metal
Technique	Welding
Size	H- 29.5 cm, W-9 cm, D- 9 cm

Final sculpture.

Plate 4.168: Project 23, final sculpture

Medium	Metal and glass
Technique	Welding, painting, soldering, lacquer application
Size	H-40cm, W-23cm, D-25.5cm
Description	Colored metal sheet was welded to form the chameleon's body. Perforated sheet was then welded to create texture on the body. A round pipe was welded to create the binoculars. A roller chain was welded on the body. Round bars were welded on the body to form the arms and legs. Wire was welded to form the tail. Polishing and application of lacquer was applied as the finishing techniques.
Visual representation /analogy	The chameleon sculpture with binoculars suggests that with keen observation and attention the world's secrets become exposed just as the chameleon can see far and wide.

Project 24. Dunia ni mwendo wa ngisi

Final drawing and Marquette.

Plate 4.169: Project 24, final drawing

Plate 4.170: Project 24, Marquette

Medium	Metal
Technique	Welding
Size	H- 10 cm, W- 33 cm, D- 24 cm

Final sculpture

Plate 4.171: Project 24, Marquette

Medium	Metal and glass
Technique	Welding, polishing, soldering, lacquer application
Size	H- 46 cm, W- 45 cm, D- 45 cm
Description	In this sculpture, roller chains were welded on the legs to create the tentacles of an octopus. Glass was soldered on the head of the octopus. Polishing, painting and application of lacquer was applied to achieve a gloss finish.
Visual representation/analogy	The octopus sculpture describes how life is full of uncertainties and surprises and one cannot always predict how things unfold.

4.4.1 Placement of sculptures in indoor public spaces

Plate 4.170 shows a number of indoor sculptures and how they would be presented in different indoor public spaces, which is the airport waiting, library and restaurant.

AIRPORT WAITING AREA

CAD RENDER - 01
Praying mantis and venus fly trap sculpture

CAD RENDER - 02
Wasp sculpture

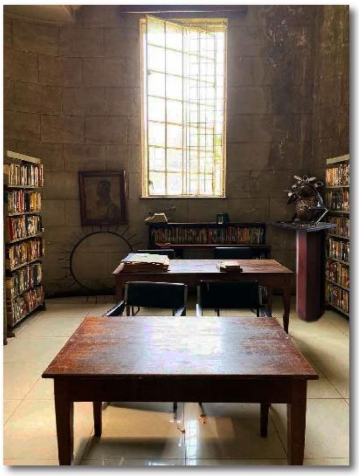
CAD RENDER - 03
Rooster and tortoise sculpture

LIBRARY

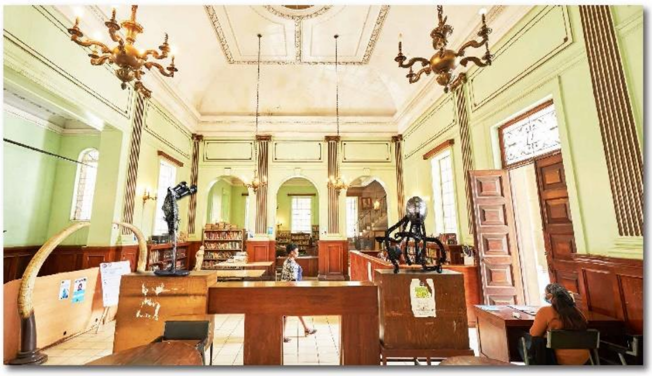
Onyiao Sachbeer Atieno
M66/20875/2020

CAD RENDER - 04
"Umoja ni nguvu " sculpture

CAD RENDER - 05
Frog sculpture



CAD RENDER - 06
Chameleon and octopus sculpture



RESTAURANT

CAD RENDER - 07
Ant sculpture

CAD RENDER - 08
Mkokoteni sculpture

CAD RENDER - 09
Bird, Samburu man and woman sculpture

Plate 4.172: Indoor sculptures and how they would appear in indoor public spaces using computer aided design.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter contains a summary, conclusions and recommendations based on the data analysed in chapter four of this study.

5.1 Summary

The study sought to utilise metal and glass in the creation of indoor public sculptures inspired by selected Swahili Kanga inscriptions. In order to carry out this, identification and selection of Kanga inscriptions was implemented. Due to the lack of pertinent examples of previous work on Swahili Kanga inscriptions being used as a source of inspirations in creation of sculptures in Kenya, the researcher examined the works of other artists from different parts of the world. The selection of Swahili inscriptions from literary materials such as books, articles and journals were purposively selected by the researcher from 4 literary sources as illustrated in Appendix A, Table 1.

With an understanding of how inscriptions had inspired other artists in other parts of the world, the researcher proceeded to develop sculptural ideas derived from the Kanga inscriptions. This work was done at Kenyatta University, Fine Art Department studio. The sculptural ideas entailed references from literary materials. The references aided in the creation of preliminary, developed sketches and final drawings for the final sculptural pieces. The themes selected for the creation of thematic indoor sculptures were kindness, love, patience, greed, hard work, caution, unity and universe. Each theme contained ten inscriptions. The themes were categorized into three (3), that is; themes on moral values, intellectual conditions of man and those that mention earth. Three inscriptions were selected from each theme giving a total of 24 inscriptions for creation of 24 sculptures using content analysis as illustrated on Table 2 Appendix B.

Experiments were then carried out on metal and glass as a material for sculpture to determine which techniques were most suitable for creation of sculptures for indoor public spaces. The study sought to experiment on the joinery and finishing techniques. All the tests carried out were illustrated in Appendix C, Table 3.

The outcome of the experiments was applied in the execution of a creative project that culminated in the development of 24 indoor sculptures using metal and glass.

5.2 Interpretation and Discussion of Findings

The following interpretations and discussions of the findings for objective one, two, three and four were derived from the study.

The first objective of the study was to select and categorise Swahili Kanga inscriptions that can be used as inspiration for the creation of indoor sculptures. The researcher was able to acquire the Swahili inscriptions from four literary sources which were later categorised into eight themes. However, not all four literary sources had categorised their inscriptions into themes. Only one literary source had prior categorization that the researcher used to categorise the selected inscriptions. The researcher was able to identify and select adequate Kanga inscriptions in the development of sculptural ideas and creation of final indoor sculptures of the study.

The second objective of the study involved developing sculptural ideas. It was noted that not all inscriptions by nature or their verbal structure were readily convertible or interpretable into sculptural ideas. The researcher therefore needed to choose very carefully and illustrate the written inscriptions to visual ideas. The researcher also found out that certain metaphors and analogies that describe the interpretation of the selected inscriptions can be used to visually illustrate Swahili proverbial and non-proverbial Kanga inscriptions. The development of sculptural ideas required a lot more time, thought process and creative input. Idea development comprised of references of the inscriptions, preliminary sketches, developed sketches and final drawings. Color pencils, ink, oil pastels, pencil, charcoal pencils, brown and manilla paper, colored sugar paper and cartridge paper were used as drawing media.

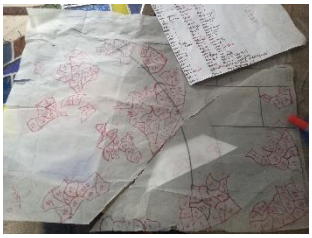
The third objective of the study involved experimenting on metal and glass using different joinery and finishing techniques. The study found that joinery techniques such as welding had different effects on metal sheets depending on the temperatures. It was also observed that metal sheets behave differently when forged due to their thickness. Bending methods were determined by a variety of tools used. Riveting tin sheets together took longer time to fasten compared to tin sheets and black metal sheet together. When joining metal and glass together the researcher covered the glass using a cloth made of leather or soldered the glass later as the welding sparks break glass once it comes to contact with it. Silicon was the best adhesive to use on glass and metal as it held the glass pieces firmly. Glass beads too used silicon as an adhesive while joining

it with glass. For the finishing techniques, use of 3 layers of lacquer was effective in achieving a shiny finish on the final indoor sculptures. The suitable tool selected in the application of lacquer was a spray gun as it was effective for both small and bigger pieces as it ensured equal distribution of paint and lacquer. A variety of materials were used to achieve different textural effects. The use of hot welding rods was also noted to be an efficient tool in applying to achieve a variety of textures on metal.

Spot welding was noted to be the best welding technique as it provided the researcher with a smooth polishing finish. The researcher also observed that metal appears differently when exposed to different rust and heating methods. In view of the findings that objective three provided, the researcher proceeded to create indoor sculptures applying the discovered knowledge when experimenting with metal and glass using joinery and finishing techniques.

The fourth objective of the study involved the application of test results of the experimentations in the creation of thematic indoor sculptures for the selected indoor public spaces. This comprised of creation of marquettes as a scale model before the final creation of sculptures. It was visually evident that the final sculptures were visually appealing which immensely helped in realistically illustrating each Swahili Kanga inscription.

The use of templates in glass and also some sculptural forms was also discovered to provide the researcher with accurate measurement of glass pieces to be joined on metal. For sculptural pieces, the templates guided the researcher in to transfer the designs by sketching the accurate measurements from paper to metal sheet. Plate 5.1 illustrates the use of templates.

 Use of tracing paper	 Use of cartridge paper	 Use of brown paper
Plate 5.1: Use of templates		

The use of templates involved use of different papers to trace and sketch out different designs of glass. Once the designs are on paper, the designs are then transferred on glass where the design was cut out using a glass cutter. Then the glass piece is then joined on metal using different joinery techniques.

5.3 Conclusion

From the experiments, analysis and findings in this study, the following conclusions were deduced for academic consideration as well as general and specific artistic usage by upcoming and professional artists.

i. Both metal and glass can indeed be used as materials in sculpture. This is evident in the indoor sculptures created by the researcher inspired by selected Swahili Kanga inscriptions.
ii. The spray gun is the most effective tool to use in applying lacquer and paint as it effortlessly ensures equal distribution of paint and lacquer effective for both small and bigger pieces.
iii. Lacquer is a good preservation method as it is clear and gives the sculpture a gloss smooth finish.
iv. Swahili Kanga inscriptions can be used as a source of inspiration in creation of sculptural works.

5.4 Recommendations

From the foregoing and particularly in the view of the conclusion this study makes the following recommendations.

i. Spot welding is recommended for sculptural work. This is because it is one of the best welding techniques for sculptures as it provides and aids in the grinding and polishing process resulting in a smooth polished finish
ii. Sculptors can explore the use of both glass and metal as a materials. This is because they are durable materials and possesses qualities suitable in the creation of sculptures.
iii. Artists should use inscriptions that are readily convertible or interpretable into sculptural and artistic ideas in the creation of artworks as not all inscriptions by nature or their verbal structure are readily convertible.
iv. Polishing and lacquer application should be used as a finishing technique in sculpture.

5.5 Area of further research

The study confined itself to the use of Swahili Kanga inspirations as a source of inspiration in the creation of indoor sculptures. Further studies by other researchers need to be carried out to further consolidate the efficacy of the use of sculptures in related interpretations using other types of inscriptions and narratives.

Further studies on techniques using a combination of metal and glass may result in new knowledge for sculptures in the round.

Exploring Kanga inscriptions utilizing relief sculptures may add a new dimension to the subject of visual/artistic interpretation

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APPENDICES

Appendix A: Categorisation of Swahili Kanga inscriptions

Table 2: List of Categorisation of Swahili Kanga inscriptions

NO.	THEME	BOOK/ARTICLE/JOURNAL TITLE	SWAHILI INSCRIPTION	SOURCE
1.	**Kindness**	Swahili Wisdom/Sayings ~ Kangas	Wema hauozi **Interpretation:** *Good deeds never goes bad. Even if you forget the good deed, the one who received your kindness will not fail to recall*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Adui aangukapo mnyanyue **Interpretation:** *When your enemy falls, lift him/her up. Helping an enemy in trouble may make a friend*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Hata matumbo ni nyama **Interpretation:** *Even the bowels are meat. Respect for all*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kila kitendo chema sadaka **Interpretation:** *Every good deed is an act of charity*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kufaa hakudhuru	Mutere, M. (2015)

			Interpretation: *Giving service does no harm. A good deed is never lost*	
		Swahili Wisdom/Sayings ~ Kangas	Lipitalo hupishwa **Interpretation:** *What has passed for some time must be forgotten; forgive and forget*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Si lazima kuzimia taa ya mwenzio ili ako ionekane **Interpretation:** *It is not necessary to blow out the other person's lamp to let yours shine*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Niletee maua ningali hai **Interpretation:** *Bring me flowers while I am still alive. Do good to others when they are still alive*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kila shetani na mbuyu wake **Interpretation:** *Everybody has somebody to talk to at liberty and is in agreement with*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Mnazi huhimili dhoruba mwembe huanguka **Interpretation:** *This means that to endure the storms of life it is better*	Mutere, M. (2015)

			to be flexible as a palm tree	
2.	**Patience**	Swahili Wisdom/Sayings ~ Kangas	Hulimbikwa nazi juu ya minazi **Interpretation:** *It is better to be patient and not try to do something too early*	Mutere,M. (2015)
		Swahili Grammar for Introductory and Intermediate Levels	Mstahimilivu hula mbivu **Interpretation:** *A patient person eats ripe fruit. It takes a long time for a seed to bear fruit and waiting is not enough, the tree has to be protected*	Oswald et al. (2014)
		Swahili Wisdom/Sayings ~ Kangas	Sishue dau na maji yajaa **Interpretation:** *Do not launch the boat at high tide. Don't put yourself in dangerous situations*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Ni heri kujizuia, kusubiri ndio njia **Interpretation:** *It is good to control oneself, patience is the best way*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kukimbia si kufika **Interpretation:** *Running is not the same as reaching your end point*	Mutere, M. (2015)

		Swahili Wisdom/Sayings ~ Kangas	Mia-chanzo chake ni moja **Interpretation:** *One hundred begins with one*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Mwenda kasi mngojee achoke **Interpretation:** *Never lose your time competing with those who are in a hurry as an fanciful person does not achieve much and often loses*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Subira huvuta heri **Interpretation:** *Patience attracts happiness as it brings close what is far away and makes difficult things possible*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Aendaye pole pole hana budi afike **Interpretation:** *One who walks with calm and care will arrive without fail.*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kila mtu na roho yake **Interpretation*:*** *Every person with their own character as each of us has to come to terms with our own difficulties*	Mutere, M. (2015)

3.	**Universe**	Swahili Wisdom/Sayings ~ Kangas	Jua halichwi bila tukio **Interpretation:** *The sun never goes down without a happening*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Bahari itatufikisha popote **Interpretation:** *The ocean leads us anywhere. Adventures at sea will teach us all about life*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Dunia ni maabara **Interpretation:** *The world is a laboratory where various experiments are going on*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kiendacho ardhini hakikosi shindo **Interpretation:** *What happens on earth does not lack being heard*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Dunia mwendo wa ngisi **Interpretation:** *The ways of the world are unpredictable*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Ulimwengu shujaa na dunia hadaa **Interpretation:** *The things of the world go to the brave, the earth deceives*	Mutere, M. (2015)

		Swahili Wisdom/Sayings ~ Kangas	Usihadaike na ulimwengu **Interpretation:** *Don't be deceived by the world*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Bahari haishi zingo **Interpretation:** *There is no stopping of disorder, confusion or changes as one has to be ready for disasters and hardship*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Dunia huleta vyema na vimbi **Interpretation:** *The world brings good and evil things*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Ulimwengu hauna siri **Interpretation:** *The world has no secrets*	Mutere, M. (2015)
4.	**Hard work**	Swahili Wisdom/Sayings ~ Kangas	Achanikaye kwenye mpini hafi njaa **Interpretation:** *A hardworking person will reap the fruits of his productivity*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Binadamu lazima ajitahidi **Interpretation:** *A human being must make an effort*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Cha bure hakipatikani **Interpretation:** *A thing for nothing is not obtainable*	Mutere, M. (2015)

		Swahili Wisdom/Sayings ~ Kangas	Washindwapo ndio washindapo **Interpretation:** *One should not give up too easily and should try to learn why one has failed and take the means to improve next time*	Mutere, M. (2015)
		Swahili Language and Culture	Atakaye hachoki **Interpretation:** *One will feel tired only after getting what she/he wants until then they do not give up*	Ali. H, O., & Ali. K, O. (2004)
		Swahili Wisdom/Sayings ~ Kangas	Ukitaka kuoga usiogope baridi **Interpretation:** *If you want to take a bath, you should not be afraid of the cold*	Mutere, M. (2015)
		Swahili Language and Culture	Ukiona vyaelea jua vimeundwa **Interpretation:** *Nothing comes out of nothing as one has to work for whatever they wish to achieve*	Ali. H, O., & Ali. K, O. (2004)
		Swahili Wisdom/Sayings ~ Kangas	Ukitegemea cha jirani utakufa maskini **Interpretation:** *If you count on your neighbor, you will die a poor person*	Mutere, M. (2015)

		Swahili proverbs II*: (436 in total-Kanga sayings)*	Bila jasho huishi **Interpretation:** You do not live without working	Africanmanners (2012)
		Swahili Wisdom/Sayings ~ Kangas	Vunja kifuu upate mbata **Interpretation:** *If one want something they have to work for it as it is not easy to get a valuable item*	Mutere, M. (2015)
5.	**Unity**	Swahili Grammar for Introductory and Intermediate Levels	Kidole kimoja hakivunji chawa **Interpretation:** *One finger cannot kill lice. It is possible to achieve greater success when you have the support of others*	Oswald et al. (2014)
		Swahili Wisdom/Sayings ~ Kangas	Dau la upweke haliendi joshi **Interpretation:** *A vessel of a single person cannot sail near the wind*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Jito likinenepa ni sababu ya mito mingine **Interpretation:** *If a river is high, it is because other rivers have joined*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kamba haipandi bila mti **Interpretation:** *A creeper does not climb*	Mutere, M. (2015)

			without a tree. Without support it's difficult to advance in society	
		Swahili Wisdom/Sayings ~ Kangas	Macho mawili huona zaidi kuliko jicho moja **Interpretation:** *Two eyes see more than one eye*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Gunia tupu halisimami wima **Interpretation:** *An empty sack can't stand upright. Refers to assistance and cooperation and has many applications*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Mafiga mawili hayaivishi chungu **Interpretation:** *Two cooking stones do not bring the cooking pot to a boil*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Ondoka twende **Interpretation:** *This shows that what has been decided is going to be completed and what will be done is not known to others*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kinga na kinga ndipo moto **Interpretation:** *To get a difficult cause moving,*	Mutere, M. (2015)

			many efforts are needed and so cooperation makes things easier	
		Swahili Wisdom/Sayings ~ Kangas	Umoja ni nguvu **Interpretation:** *Unity is strength*	Mutere, M. (2015)
6.	**Greed**	Swahili Wisdom/Sayings ~ Kangas	Changu chetu,chako chako **Interpretation:** *If sharing is the norm, then everyone should share*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Alaye peke hufa peke yake **Interpretation:** *One who eats alone dies alone. The one who refuses to share blessings with others will have to endure all hardship alone*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Chanda ukipewa usikimeze chote **Interpretation*:*** *If you are given a finger, do not swallow it all. Be grateful for the little*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Chanda ukipewa usikimeze chote **Interpretation*:*** *If you are given a finger, do not swallow it all. Be grateful for the little*	Mutere, M. (2015)

		Swahili Wisdom/Sayings ~ Kangas	Fuata nyuki ukafe mzingani **Interpretation*:*** *Follow the bee and then die in the hive. Greed can kill*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Husudi yaua kwa jicho la wivu **Interpretation:** *Jealousy kills with the eye of envy*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Mali kwa mali **Interpretation*:*** *Possessions for possessions. Nothing for nothing*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Tajiri mwenye maelfu hakatai shilingi **Interpretation:** *A millionaire does not refuse one shilling*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Ubepari ni unyama **Interpretation:** *Exploitation is beastly*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Pupa haliishi **Interpretation:** *Greed never ends*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kichache hakitutoshi na kingi halikulishi **Interpretation:** *A greedy person is never satisfied. He or she always wants more*	Mutere, M. (2015)

7.	**Love**	Swahili proverbs II*: (436 in total-Kanga sayings)*	Akipenda chongo huita kengeza **Interpretation:** *Love reflects no evil*	Africanmanners (2012)
		Swahili Wisdom/Sayings ~ Kangas	Akutendaye mtende **Interpretation:** *Do harm to the one who harms you*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Haina tabibu ndwele ya mapenzi **Interpretation*:*** *The disease of love has no cure*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Heshima ni moyo **Interpretation:** *Respect is of the heart. Respect, like love, is a free gift*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kipendacho moyo ni dawa **Interpretation:** *What the heart desires is like medicine to it A little of what you fancy does you good*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Undugu wapita urafiki **Interpretation*:*** *Brotherhood is greater than friendship*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Ukipenda, pemnda chako **Interpretation:** *If you love, love what is yours*	Mutere, M. (2015)

		Swahili Wisdom/Sayings ~ Kangas	Mahaba yaua **Interpretation:** *Love kills*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Mkono wako ukichafuka huukati **Interpretation:** *means if your relative errs, you should help so that that person may avoid any recurrence of the disaster*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Radhi ni ushindi **Interpretation*:*** *One who forgives has learnt the force of hate*	Mutere, M. (2015)
8.	**Caution**	Swahili Wisdom/Sayings ~ Kangas	Bila silaha usiingie vitani **Interpretation*:*** *Do not join in a fight if you have no weapons. Do not start anything without making adequate preparations*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Kamata unachokiona, usingoje kijacho **Interpretation*:*** *Take it when you see it, don't wait for what might come*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Lisilo mkoma hujikoma lilo **Interpretation*:*** *What has no one to end it,*	Mutere, M. (2015)

			ends itself. If you do not guide and bring your business to an end, then it may not end to your liking	
		Swahili Wisdom/Sayings ~ Kangas	Ukifumba jicho, tega sikio. **Interpretation*:*** *If your eye is closed, be sure to listen*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Mwana wa mbuzi hufagia alalapo **Interpretation*:*** *A kid of a goat sweeps where it sleeps*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Fua chuma wakati kingali na moto **Interpretation*:*** *Strike the iron while it is still hot*	Mutere, M. (2015)
		Swahili Language and Culture	Jogoo wa shamba hawiki mjini **Interpretation:** *A village rooster does not crow while in town. It means that some things only fit in some environments*	Ali. H, O., & Ali. K, O. (2004)
		Swahili Wisdom/Sayings ~ Kangas	Wakati hauna saburi	Mutere, M. (2015)

			Interpretation*:* *Time has no patience. Time does not stand still*	
		Swahili Wisdom/Sayings ~ Kangas	Nduli mjue **Interpretation*:*** *Know your enemy*	Mutere, M. (2015)
		Swahili Wisdom/Sayings ~ Kangas	Chachu kidogo huumua mkate **Interpretation*:*** *A little yeast raises the loaf. A small fire destroys a big forest*	Mutere, M. (2015)

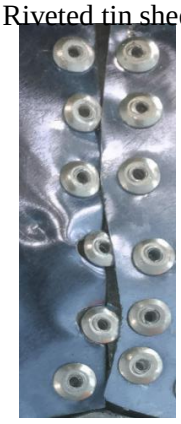
Appendix B: Content analysis

Table 2: Content analysis by category

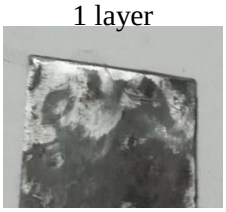
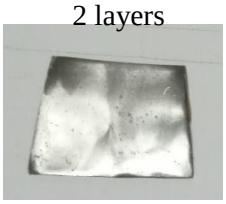
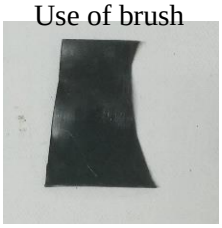
CATEGORY	THEME	NO. OF INSCRIPTIONS	30% OF EACH THEME
Inscriptions on moral values	Patience	10	3
	Kindness	10	3
	Love	10	3
	Hard work	10	3
	Caution	10	3
	Unity	10	3
Inscriptions that mention earth	Universe	10	3
Inscriptions on intellectual conditions of man	Greed	10	3
		Total: 80	**24 inscriptions**

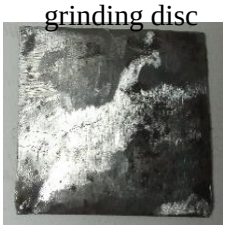
Appendix C: Observation data on metal and glass test

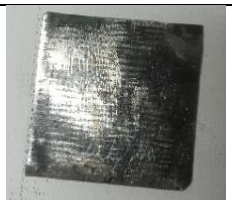
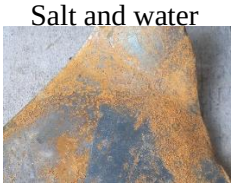
Table 3: Data collected on joinery and finishing techniques

STUDY	TEST NO.	IMAGE	OBSERVATION	CONCLUSION
Joinery techniques	1.Welding	 Welded metal  Welded metal  Welded metal	High temperatures of 250 amps burn the metal and lower temperatures of 50 amps do not join metal together. Moderate temperatures between 220 and 222 amps join metal together without destroying the metal sheet.	220 to 222 amps is the moderate temperature for welding.
	2.Riveting	 Riveted tin sheet  Riveted tin sheet	The rivet gun took 6 to 10 seconds to fasten tin sheets together while it took 5 to 7 seconds for the rivet gun to fasten tin sheet and black metal sheet together. Once the rivet head joins the metal together, the lower part of the rivet known as the mandrel comes off.	Riveting is achieved once the lower part of the rivet comes of when joining metal.

	3.Soldering	 Soldered glass  Soldering glass on metal	The soldering technique entailed the use of a solder, copper foil, flux and a soldering iron. Once the glass piece was cut, it was later grinded using a glass grinding machine to smoothen the edges. The glass edges were wrapped using the copper foil to aid in the use applying solder on the foiled glass and areas for joining it on metal.	The use of flux during soldering enhances the flow of solder and joins metal and glass firmly.
	4.Leading	 Leaded glass	Leading technique entailed the use of lead strips, solder, flux and a soldering iron. Flux was applied on different areas to aid in the use of a solder. Then it was later cleaned with patina and a brush to preserve and strengthen the glass.	Leading is best used for thick glasses as it firmly holds the glass piece.
	5.Mosaic	 Glass mosaic	Silicon takes 5 to 15 minutes to attach on metal while cement paste takes 2 to 4 minutes to attach on metal which is relatively fast than silicon. It was observed that white	For a strong bond on metal, silicon gave the good results as the best adhesive to be used.

			cement paste was no a strong adhesive as glass pieces were falling off despite it attaching quicker than silicon.	
Finishing techniques	1.Lacquer application	 1 layer  2 layers  3 layers	Clear lacquer was thinned using a standard thinner.1 to 3 coats were applied on the metal. This was done to determine the finish of the metal. It was observed that the first coat did not give the metal a polished look until the third coat was applied. Lacquer takes 3 to 5 minutes to dry in open air and 5 to 12 minutes in an enclosed space.	Metal surfaces present a better glossy finish when 3 layers of lacquer is applied.
	2. Painting	 Use of brush  Use of brush  Use of a spray gun	It was observed on each metal surface that the use of brush in application of paint for the first layer left some uneven brush strokes on the metal and some parts were not covered in paint evenly. The more layers applied, the even brush strokes appeared on each metal surface.	Paint on metal surfaces is best applied using a spray gun unlike a brush.

			However, the use of spray gun distributed the paint evenly whereby spraying was only done once. It takes 2 to 5 minutes to dry in open air and 4 to 10 minutes to dry in an enclosed space.	
	3.Texturing	 Texture using different metal materials	A variety of metal materials which included spanners, nails, roofing nails, different types of wires, spoons, forks, bearing balls, screws, washers, roller chain and scrap metals. It was also observed that welding rods also applied a variety of textures on metal surfaces when melted.	Texture on metal surfaces can be achieved using different metal materials and also using welding rods melted on them.
	4.Polishing	 Use of a grinding disc  Use of a grinding disc	Different polishing discs were used to achieve a smooth finish on metal. This was done by using a flapping disc, grinding disc and sand paper. The grinding disc was first used to smoothen out a weld, grind through metal edges and metal surfaces and also	The appearance of metal is determined by the use of different polishing discs.

		 Use of a flapping disc  Use of a sandpaper	remove rust. The flapping disk provided precise blending and finish depending on the finish the researcher wanted to achieve. The sand paper was finally used to obtain a very optimal finish without compromising the surface of metal.	
	5. Rust	 Rain water Natural rust  Natural rust and rain water  Salt and water  Rain water	Rust was achieved through various methods such as placing metal sheets on the rain, use of salt and water and naturally rusted metal on rain water where they were left over night for the rusting process. This methods were also applied on other metal materials and scrap metal. It was observed that metal sheets, scrap metal, round bars and pipes and square tubes achieved the rust effect easily.	Metal surfaces acquire a variety of rust effects from different methods to achieve rust.
	6. Smoke	 Use of smoke	Use of smoke on metal was used to form soot on the metals surface. This was done by the	Smoke can be used to add color on metal surfaces.

			use of lubricated metal sheet where it was burnt using paper for 4 to 6 hours to form soot on metal.	
	7. Heat	 Use of heat	Heat was used metal where the flame is slowly and evenly done until it changes color. Patina was also applied on metal to make the surface darker when heating the metal. The process of changing color takes 15 seconds to 1 minute depending on the intensity of color on metal.	The intensity of the color on the metal surface was determined by the application of patina and exposure of the flame.

Appendix D: Creative project

Table 4: Summary of the creative project

SWAHILI KANGA INSCRIPTION	TECHNIQUE	MATERIAL	SPACE	SIZE
1. Kidole kimoja hakivunji chawa	Welding Leading Polishing Lacquer application	Metal and glass	Restaurant	H-79cm W-274cm D- 31cm
2. Ondoka twende	Welding Soldering Painting Lacquer application.	Metal and glass	Airport waiting area	H-97 cm W- 210 cm D- 36cm
3. Umoja ni nguvu	Welding Soldering Polishing Painting Lacquer application	Metal and glass	Public library	H-86cm, W-80cm D-56cm
4. Changu chetu, chako chako	Welding Mosaic Lacquer application	Metal and glass	Restaurant	H-30cm W-123cm D-25.5cm
5. Pupa haliishi	Welding Painting Lacquer application Texturing	Metal and glass	Airport waiting area	H-40cm W-43cm D-22.5cm
6. Kichache hakikutoshi na kingi halikulishi	Welding Painting Silicon Lacquer application	Metal and glass	Public library	H-66.2 cm W-23.5 cm D- 17.5 cm
7. Akipenda chongo huita kengeza	Welding Painting Silicon Lacquer application	Metal and glass	Restaurant	H-92cm W-57.2cm D-31cm
8. Kipendacho moyo ni dawa	Welding Painting Mosaic Soldering Lacquer application	Metal and glass	Airport waiting area	H-50cm W-10.1cm D-10.1cm
9. Ukipenda, penda chako	Welding Painting	Metal and glass	Public library	H- 41.5cm W- 29.5 cm

	Soldering Texturing			D- 20.6 cm
10. Niletee maua ningali hai	Welding Polishing Panting Silicon Lacquer application	Metal and glass	Restaurant	H- 49.5 cm W- 75.7 cm D- 23.2 cm
11. Wema hauozi	Welding Polishing Silicon Lacquer application	Metal and glass	Airport waiting area	H-69cm W-71cm D-31.2cm
12. Adui aangukapo, mnyanyue	Welding Painting Soldering Lacquer application	Metal and glass	Public library	H-45.5 cm W-37 cm D- 25.4cm
13. Atakaye hachoki	Welding Painting Soldering Lacquer application	Metal and glass	Restaurant	H- 55 cm W- 98 cm D- 40 cm
14. Achanikaye kwenye mpini hafii njaa	Welding Polishing Heating Soldering Lacquer application	Metal and glass	Airport waiting area	H-88.5cm W-84cm D-46.4cm
15. Cha bure hakipatikani	Welding Painting Soldering Polishing	Metal and glass	Public library	H- 35.3 cm W- 50 cm D- 21 cm
16. Jogoo wa shamba hawiki mjini	Welding Painting Riveting Texturing Rust Smoke Soldering Lacquer application	Metal and glass	Restaurant	H- 50 cm W- 53 cm D-32.3cm
17. Mtoto wa mbuzi hufagia alalapo	Welding Soldering Painting Rust Lacquer application	Metal and glass	Airport waiting area	H- 38 cm W-56 cm D- 39.8 cm
18. Chachu kidogo huumua mkate	Welding Soldering	Metal and glass	Public library	H-53m W-24.5cm

	Polishing Lacquer application			D-15cm
19. Subira huvuta heri	Welding Polishing Soldering Lacquer application	Metal and glass	Restaurant	H-106.5cm W-44cm D-22.3cm
20. Mvumilivu hula mbivu	Welding Soldering Painting Lacquer application	Metal and glass	Airport waiting area	H- 48.5 cm W- 22 cm D- 16.5 cm
21. Aendaye polepole hana budi afike	Welding Soldering Painting Polishing Mosaic Texturing Lacquer application	Metal and glass	Public library	H-27cm W-38.5cm D-28.5cm
22. Dunia huleta vyema na vimbi	Welding Soldering Painting Polishing Lacquer application	Metal and glass	Restaurant	H-41.5cm W- 24.8 cm D- 15.4 cm
23. Ulimwengu hauna siri	Welding Soldering Polishing Lacquer application	Metal and glass	Airport waiting area	H- 53 cm W- 16.5 cm D- 17 cm
24. Dunia ni mwendo wa ngisi	Welding Soldering Polishing Lacquer application	Metal and glass	Public library	H- 47 cm W-46 cm D- 45 cm

Appendix E: Budget

Table 5: Budget

NO	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL COST
1.	Black sheet metal	9 sheets	Sh. 3,800 per sheet	Sh. 34,200
2.	Metal square tube	11 pieces	Sh. 950 per square tube	Sh. 10,450
3.	Metal round bars	15 pieces	Sh. 750 per round bar	Sh. 11,250
4.	Metal round pipe	10 pieces	Sh. 920 per round pipe	Sh. 9,200
5.	Metal flat bar	6 pieces	Sh. 650 per flat bar	Sh.3,900
6.	Wire	12 pieces	Sh. 200 per kilogram	Sh. 2,400
7.	Galvanized wire	10 pieces	Sh. 170 per kilogram	Sh. 1,700
8.	Transport cost	Not specified	Sh. 21,000	Sh. 21,000
9.	Scrap metal	25kgs	Sh. 510 per kg	Sh. 12,750
10.	Glass; cut off pieces of stained and textured glass	10kgs	Sh. 3200 per kg	Sh. 32,000
11.	Copper foil	10 packets	Sh. 480 per packet	Sh. 4,800
12.	Metal tools	Not specified	Sh. 26,550	Sh. 26,550
13.	Glass tools	Not specified	Sh. 14,670	Sh. 14,670
14.	Solder	5 pieces	Sh. 960 per piece	Sh. 4,800
15.	Grinding discs	10 pieces	Sh. 200 per piece	Sh. 2,000
16.	Cutting discs	25 pieces	Sh. 200 per piece	Sh. 5,000
17.	Polishing discs	20 pieces	Sh. 150 per piece	Sh. 3,000
18.	Welding rods	9 boxes	Sh. 865 per box	Sh. 7,785
19.	Lacquer paint	5 liters	Sh. 520 per liter	Sh. 2,600
20.	Thinner	10 liters	Sh. 385 per liter	Sh. 3,850
21.	Rivets	100 pieces	Sh. 10 per piece	Sh. 1000
22.	Paints	5 liters	Sh. 200 per liter	Sh. 1000
23.	Assistant researcher	2	Sh. 35,500 per researcher	Sh. 71,000
24.	Upkeep and travel	Not specified	Sh.64,000	Sh. 64,000
25.	Presentation	Not specified	Sh. 28,760	Sh. 28,760
26.	Miscellaneous	Not specified	Sh. 11,000	Sh. 11,000
TOTAL				**Sh. 390,665**

Appendix F: Research Authorisation, National Commission for Science, Technology & Innovation

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **450504**

Date of Issue: **04/March/2024**

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