



ADRRI JOURNALS ([www.adrri.org](http://www.adrri.org))

E-ISSN: 2343-6891 VOL. 17, No. 6 (5), July, 2020- September, 2020

**Design and Fabrication of a Sheet Metal Statue:  
A Symbol of Reflection on Mother and Child Affection**

Ofori, D. H<sup>1</sup>., Larbi P. F<sup>2</sup>., Kushiator G<sup>3</sup>., Okyere B K<sup>4</sup>

<sup>1</sup>Department of Industrial Art, Faculty of Art, CAFE,  
Kwame Nkrumah University of Science and Technology, Kumasi, Ghana,

Email: [oforisticdee@yahoo.com/](mailto:oforisticdee@yahoo.com/)

<sup>3</sup>Department of Communication Design, Faculty of Art, CAFE  
Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Email: [gkushiator1@gmail.com](mailto:gkushiator1@gmail.com)

<sup>2</sup>Department of Technical Skills, Koforidua Technical Institute, Ghana

Email: [pflarbi3@gmail.com](mailto:pflarbi3@gmail.com)

<sup>4</sup>Department of Visual Art, Adventist Girls Senior High School-Ntonso, Ghana

Email: [bokcongisd@yahoo.com](mailto:bokcongisd@yahoo.com)

<sup>3</sup>Correspondence: [gkushiator1@gmail.com](mailto:gkushiator1@gmail.com)

Available Online: 30<sup>th</sup> September, 2020

URL: <https://www.journals.adrri.org/>

**Abstract**

It is a common knowledge that lack of knowledge, skills and techniques in the use of some materials still exist among artists in Africa and many parts of the world. This situation has created a challenge for contemporary artists to make use of appropriate methods, techniques and the knowledge available to transform these materials into artifacts. As a result of this challenge, sculptural pieces produced in Africa using metals are not even portrayed in female abstract figures that show most of the body parts well pronounced. Moreover contemporary sculptures in Ghanaian society in most cases lack the symbolic power to educate and remind the people about the vital role played by women. Therefore the purpose of this paper is to create a semi-abstract metal statute employing a sheet metal fabrication and cold bending techniques through practice-based and descriptive methodologies. The results indicated that exploring welding and fragmented sheet metal fabrication techniques could create a semi-abstract metal statute as

the symbolic power to educate and remind the people about the vital role played by Ghanaian women in the nurturing of their children.

**Keywords:** statute, fabrication, metal, sculpture, symbolism.

[**Cite article as:** Ofori, D. H., Larbi, P. F., Kushiator, G., Okyere B. K. (2020). **Design and Fabrication of a Sheet Metal Statue: a symbol of reflection on Mother and Child Affection.** ADRRI Journal of Arts and Social Sciences, Ghana: Vol. 17, No.6 (5), Pp.38-58, E-ISSN: 2343-6891, 30<sup>th</sup> September, 2020.]

*Received: (July 28, 2020)*

*Accepted: (September 30, 2020)*

## INTRODUCTION

A statute could be described as a free-standing sculpture piece of persons or animals. Sculpture pieces are produced using a wide variety of methods and materials including but not limited to wood, cement, wax, stone and metals. The production of sculpture in traditional African societies including the present Ghana is inspired by philosophies, ideas and thoughts which are common to societal life ( Kushiator, et al 2019: Fosu, 2004). Therefore, the production of the statue in this study is not meant to serve as an object of worship in any form. It is rather made only for aesthetic, decorative and commercial purposes based on African symbolism. Symbolism has been a core aspect of many cultures in Sub-Saharan Africa because it embodies the beliefs, ideas, concepts, norms and values of such society. In Ghana for instance, the sole aim of a symbol in an artifact is to propagate and educate the society about Ghanaian cultural philosophies.

Beside the production and propagation of art works using different types of materials, it is a common knowledge that lack of knowledge, skills and techniques in the use of some materials still exists among artists in Africa and many parts of the world. This state of affairs has created a challenge for contemporary artists to make use of appropriate methods, techniques and the knowledge available to transform these

materials into metal statues. In Ghana as in many African societies, sculptors employ different types of materials, methods and techniques to create sculptural pieces but those which are made in metals are not even portrayed in female abstract figures that show most of the body parts well pronounced. According to Rangwala (2008), sculpture produced in Africa using the various types of welding techniques, steel forms and the application of the fragmented sheet metal fabrication and cold bending processes are hardly seen in the African society. Moreover contemporary sculptures in Ghanaian society in most cases lack the symbolic power to educate and remind the people about the vital role played by women.

This situation has created a research gap in contemporary art practice that needs to be explored by emerging artists who are involved in the design and fabrication of sheet metal statues. The objective of this paper therefore is to construct a semi-abstract metal statute employing sheet metal fabrication and cold bending processes as a symbol of reflection on mother and child affection. The research question is how can a semi-abstract metal statute be constructed employing a sheet metal fabrication and cold bending processes symbolize of reflection on mother and child affection? The significance of this project is chalked in its to exposure of emerging artists to new knowledge, skills, methods and techniques in the use of same materials in the construction of a sheet metal statues that wields the symbolic power to exhibit the wonderful role played by Ghanaian women in the nurturing of their children.

### **Historical Context of Statute**

The creation of prehistoric sculpture including statues were done using stone and clay; were used as instrument of ritual, worship and for documentation purposes. Adom (2014) asserts that statues as sculpture pieces in African indigenous society were mostly

used for religious purposes including ancestor veneration, a representation of and abode for deities and a symbol of fertility, aesthetic appeal, and the commemoration of events. Apart from their aesthetic appeal, such small size statues were considered to have a link to witchcraft associated with African cultures. Different kinds of terrifying animal statues including masks and triptych sculpture were used as representation of supernatural powers, mostly the bad that could harm the members of the society.

They have the power to create and define the statue which could be smaller than the normal size of a freestanding statue which is usually done in clay, wood or any malleable material (Tola 2017). The aesthetic value of statues can be seen from artists and the societal perspectives. The artist's perspective highly focuses on the artistic or dramatic ways of constructing and understanding the symbolism of statues. Most people might not understand the aesthetic value and symbolism of certain types of statues essentially, statues that are classified under artistic or dramatic types of statues categorized as abstract (Tola 2017).

Such statues may not always have historically grounded narratives about the society. The statute piece is not always supposed to be static and decorative, but can also be mobile and functional. Due to this, artistic statues are not frequently seen in the streets of cities. They are mostly found in individual homes or in the museums. According to Tola (2017), statues have power to tell all aspects of the individual or society. They serve as a time capsule between the past, present and future. Statues also tell concrete evidence about the root identity of an individual or a nation. A statue can also be produced to commemorate an anniversary of a great personality.

## **METHODOLOGY**

The study employs qualitative practice-based and descriptive research methodologies through experimental studio art practice. The studio-based research method enables techniques of the researchers to explore with the available tools, materials and equipment, the welding and fragmented sheet techniques for the production of a lighting sculpture piece. This study adopted metal smithing based production processes to fabricate the artifact and obtained a result which is typically a lighting sculpture reflecting the tender motherly care.

The welding and fabrication techniques used for the production of the artifact offer a lot of advantages as compared to the other methods that could have been used. These advantages include effective and efficient use of different steel products, cutting down double expenditure by mounting platforms for sculpture piece, for mobility and durability. Techniques such as hollow metal sculptures fabricated with lightweight sheet metals without strong armatures may not be as durable or able to sustain external pressures as these; and those made of plaster of Paris, cement, clay, or of other materials, would have required another form of support which comes with an extra cost.

The materials used include mild steel forms (steel rods, angle bar and steel sheet), welding electrode, electrical cables, PVC pipe, switches, lamp holders, bulbs, filler and metallic paint. The steel bars were used for the base of the armature whilst the steel rods were used to build the skeletal framework around which the sheet metals were fabricated as the outer coverings of the sculpture pieces. The electrodes were used for the joining of the metals parts through the technique of welding. The switches, lamp

holders, bulbs and the PVC pipes were collectively used with the cables to connect electricity to the sculpture pieces.

The filler and the metallic paint were used to enhance the surface quality of the statues. Categorized tools used included cutting tools (hacksaw, hand saw, cold chisel, shears and hand files), measuring, marking and setting-out tools (tape measure, try square and scriber) and shaping tools hammers and (metal stakes). Bench vice, anvil, guillotine, grinder and welding machine are the examples of equipment used.

### **Design Process**

The designing stage of the project involved a series of sketches which led to the outcome of the actual artifacts which the researcher chose as masterpiece for fabrication. The figures 1 to 3 below show some of the sketches that helped to arrive at the blueprints for this project work. Figure 3 was selected for further development till the final drawing for the fabrication were obtained



Figure 1 sketches

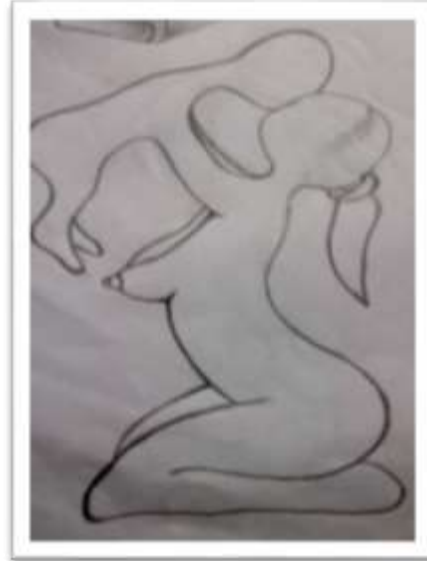


Figure 2 sketches



Figure 3; Selected Abstract design:



Figure. 4: Rendered abstract designs

### **Fabrication Process**

The metals were straightened for easy measuring, cutting and setting out processes to be carried out as in figure 5. After measuring and marking out, the bars were cut in

preparation for the welding process. All the cutting at this stage was done manually with the use of the Pistol Type Hacksaw set with an 18 TPI blade.



Figure 5: Measurement of Metal



Figure 6: Cold Metal Bending

The type of bending process used for the entire project was cold bending as in figure 6. The manual bending of the flat bars was done on a flat tabletop and in a bench vice. Sheets and quarter rods were bent on wooden and metal stakes with the aid of a wooden mallet. All the above processes were carried out to prepare the various steel forms for assemblage into the required statue.

In fixing the pedestal of the statute, a square platform which would be attached to the base of the artifact was fabricated in order to avoid any further expenses in mounting other platforms for the work. It was also one of the objectives to improve upon the rigidity and stability of most mounted statues, by making these works somehow mobile so that the user can easily move them any time the need arises for a change in the position of the artifact, due to renovation or relocation of the user or users.



After the preparation of the steel forms, the angle bars are chosen for the fabrication of the pedestal. The sizes of angle bars used had been discussed in the 'materials for the research' section of this project. Setting out (checking squares of angles) was done by the use of engineer's square (popularly known as set square). Tack-welding of the various components was done. After the tack-welding process had been satisfactorily completed, joints were arc welded.

After welding the lower part of the platform, the lengths of 15cm each, were also welded at right angles to the inner corners of the platform in order to provide a strong and rigid support for the main body of the statue. The 12mm iron rods were measured to fit the inner angles of the platform and welded at 15cm square intervals inside its lengths and breadths. The fabrication process continued with the forming of the upper rectangular platform or pedestal upon which the armature of the figure was to be built using the angle bars and iron rods. This is shown in figure 7. This stage of the fabrication process involves the formation of the framework or armature for the statue.



Figure 7: Platforms for the armature



Fig 8: Joining rings to the spine

The spine of the armature was formed out of iron rods. Two rods were attached side by side and welded through the entire length. This spine served as the attaching points for the bent rods and the flat bars that formed the parts of the body. The spine was firmly attached to the platform onto which quarter rods and flat bars used for the fabrication of rings and other curvatures that could easily give the shapes and forms needed to build the main body of the statue were attached. The figure below depicts the fabricated armature for the bust and limbs figures 8, 9 and 10.



Fig 9: Fabricated bust and limbs.



Figure 10: Completed armature

After the completion of the armature, cutout paper patterns were traced from sections of the armature and transferred onto the sheet metal. These were individually cutout technically with chisel or jigsaw, depending on the simplicity or complexity of the shape. The individual parts and or shapes on the sculpture were dealt with as different units during the cutting out process. This process has been described as the 'Fragmented sheet metal cold forming technique' and captured in figures 11 and 12 respectively



Figure 11: Cutout Paper Patterns



Figure 12: Cutout Templates

### **Cladding the Body of Statue**

The study applied the folding, bending, twisting and wrapping techniques in the fabrication of the artifact. Though the posture of this statue is more complex, almost all the materials, processes, tools and equipment used in fabricating this statute were studio-based. The building of the main body of the artifact started with the welding of the chest region which extended to the upper part of the belly closer to the breast, and the left and right upper arms. Because the entire work was cold-formed and welded, shape forming was a little difficult. The thoracic region was divided into two sections with the lower section forming part of the upper belly and the armpit. These two sections were welded together by Arc welding process. The arms were also divided into sections and later welded together as shown in figures 13 and 14 respectively.



Figure 13: Welding the chest and upper arms. Figure 14: Welding the back with templates.

The next stage of the body building was on the waist, the back, the occiput and the neck of the mother. The templates for the building of this part of the artifact was also fragmented; the waist region had two parts, two templates for the back and truncated cylinder for the neck of the mother figure. The templates were joined by welding them in an overlapping manner from the waist to the upper part of the back as shown in figure 15

The head was formed out of four different oval shaped templates, but only the occiput was first fabricated due to the light fittings that had to be done later. The neck of the mother figure was folded round that part of the armature and then welded at a joint and to the top edges of the back. Parts which could not meet each other exactly were welded using unshielded electrodes and quarter rods as filler metals as shown in figure 16.



Figure 15: Attaching the neck and back to upper arms Figure 16: Joining the neck to occiput

The study proceeded with the fabrication of the lower arms, thighs, legs, feet and the buttocks of the mother figure. Templates cut flat and folded into truncated forms of cones were used for the lower arms with other pieces of templates joined to them at points closer to the armpits of the baby figure abstractly to serve as the finger and palm that held the baby on both sides. The thighs of the artifact were each formed out of four different half-oval templates which were bent slightly in order to achieve the curvature in human thighs as shown in figures 17 and 18



Figure 17: Welding the lower arm:



Figure 18: Forming and joining the thigh.

The researchers fabricated the baby figure with parts of it having an armature, but its limbs were without armature for easy attachment to the main body as against the reduction of weight. The back and the front parts of the baby figure were formed out of two templates. One template was used for the buttocks, the left and right sides were covered with a template each, with the arms formed out of two tubes that were also manually cold formed. One end of each tube was flattened and grounded to the shape of abstract fingers.

The legs were formed out of folded templates which were attached to the lower parts of the thighs. The feet were formed differently due to the posture assumed by the mother figure. The left foot was formed out of two templates; one for the top of foot which also abstractly covers the toes and one for the heel which was joined to the top of the platform with its sides welded to the ankle region. The right foot was formed out of three different shapes of templates as shown below in figure 19



Figure 19: Welding the baby figure



Figure 20: Setting the hinge

The breasts were formed out of two truncated cones. The cones were cut in slanted forms to make them possible to hang in a protruding manner from the chest down.

Before fixing the breast, holes were created at the very spot where they were to be fixed in order to avoid unnecessary heat causing the metal to melt during welding and also air pockets getting trapped in them. Figures 21 below shows the cones used in forming the breast and the welding process.

The head of the mother figure was sealed half way inside because of its symbolic function. On top of that seal was connected the switch that would make it possible for the baby's head to reflect the affections that the mother proverbially wanted to portray. The possibility of such a connection would answer the analogy that most decisions taken by children and for that matter, humans, are informed or influenced by the thoughts of parents, especially mothers.

The other half of the head which formed the cover of the head was also fabricated out of two oval shaped templates lined at the edges with a flat bar having locking mechanisms along the inner ring, making it impossible for it to fall off. It also has a hinge at the mouth area which makes it easier for opening and closure. Below is the completed statue yet to go through finishing processes which involves grinding, filler work, light fittings and spraying as shown in figures 21 and 22 respectively

### **Grinding and filling the statute**

The bigger size Bosch portable electric grinder was used to grind almost all the joints and also the rough surfaces created as a result of the welding processes. Metal filler was mixed with hardener and applied in bits to fill areas which had some folds and rough surfaces due to hammering, pushing, and uneven folding. The applied filler was left overnight to enable it to dry properly. The work was sanded using a portable electric grinder. The sand paper was fixed onto the grinding disc of the grinder and with their

spinning action, the surfaces of the artifacts were sanded to the required shapes and smoothness before the application of primer



*Fig. 21: Completed ground work*



*Fig. 22: Filled statue with hardener.*

### **Application of Primer and Coral Paint**

The primer was diluted with gasoline for the priming of the statue as shown in figure 23. The actual application was done using a medium sized compressor machine connected to a five meter hose and a spray diffusing cup with a fine nozzle. Coral paint was sprayed onto the work to give it a very good finish. Figure 24 shows the finished semi-abstract statue. The colours chosen were dark-brown and black. The paint was sprayed onto the works to give it a smooth, decorative and protective finish.





Figure 23: Application of primer



Figure 24 'Obaatanyee' (final work)

## RESULTS AND DISCUSSIONS

### Fabrication of Statute

The statue measures 69cm by 62cm by 168cm (length, breadth and height respectively). The head of the artifact, due to its function and symbolism, had to be cut into two and a hinge fixed to it. When that was done, it was noticed that the joint was not aligning smoothly, so the researcher had to use a metal band to reinforce the seam. During fabrication of the baby figure, its legs were first made cuboidal in shape. This, however, was not appealing enough so they were changed into cylindrical profiles. The head of the baby figure which was to house the reflective light was also cut in three-quarter up for the top part to function as the lid (cover), but the whole head was found to be too to house that the  $\frac{1}{4}$ " rods supporting the lid and the reflectors. To avert this situation,  $\frac{3}{4}$ " flat bars, were used to replace the  $\frac{1}{4}$ " rods. This change also worked perfectly and the problem with electric fittings was solved.

During the filler application process, there were parts of the work which were not very accessible to the researcher due to the gaps between the mother and the child. Areas such as the chest of the baby, its chin, the front part of its neck and the mother's armpit closer to the baby's chest, were all filled by dipping the finger into the filler and then applying on those areas. There were a few folds, exposed welded joints, dents and crooked areas due to the pressure from the cold forming tools. These were also resolved with the application of filler which made the entire work look like a unit without any seam and all these tests solutions contributed to a better output. Sanding of obscure comers was also done with sandpaper and the bare hand. This did not really help to achieve a better smoothness as compared with the other exposed areas, but was still better and could receive the colour.

### **Reflection on Mother and Child Affection**

The project has led to the fabrication of a metal statue that is serving as a source of light to its immediate surrounding and symbolically depicting the affection and the love of women towards their babies. This symbolically stands for the hidden moral treasures of the mother which the child is expected to reflect in future. The little girl in this statue is reflecting what has been transferred from her mother into her. This depicts how the training that the mother imbibes in her would be reflected in her future life. The statue is in appreciation of the efforts of women in bearing and caring for children.

The title of the statue is 'Obaatanyee', a twi word which means 'motherhood is not an easy task'. It is a reflection of the symbiotic mother and child affection. The figure shows a mother kneeling stressfully on her right leg with the left leg in a somehow squatting position, raising her baby boy of about one and a half year up and also having eye to eye contact with the baby. This shows how mothers uphold and hail their

children. The way the mother is staring at the child shows how she might be reflecting on the agonies she might have gone through before or during delivery and her toils do not go to wastes but would like to nurture this baby to become a better person in future. The statute seems to impact on the psychic when observed, and would serve as a good image for art therapy.

A critic may want to know why the female figure was mounted on a square platform. It is imperative that apart from the Virgin Mary, no man born of a woman has been able to bear a child without a man's effort, whether directly or indirectly. It is also true that square and rectangular shapes represent male figures, so the researchers opted for a muscular support or platform to seal the proverb in Akan which says that 'se obea to tuo a, etwere Obarima dan mu'; translated as 'when a woman buys a gun, it is kept in a man's room'. This means the man is the overall boss of whatever a woman owns including her affection, hence a man is the architect or the greatest supporter of a woman.

This mother figure is a central object of worship in several religions. For example, images of the Virgin and Child call to mind Egyptian representations of Isis nursing her son Horus. The representations of Madonna and child: the cult of Virgin Mary in the Middle East. The history of the Virgin Mary, mother of Jesus Christ, depends on texts of the Gospels in the bible. As it has been an embellishment to her legend, it seems to have taken form in the fifth century in Syria (Heilbrunn, 2000). Most images of the Virgin stress her role as Christ's Mother in a standing position holding her son. The manner in which the Virgin holds Christ is very unique. Certain poses were developed into "types" that became names of sanctuaries or poetic epithets (Heilbrunn, 2000).

The importance of Mother and Child sculpture cannot be over emphasized. This is why mothers at all times would like their children to reflect the love they have for the younger ones. Images of women holding children may reflect a number of ideas, for example, they may represent the affections of fathers, mothers, ancestors and serve as symbols of lineage. It is believed that the childless wife bears a scar which nothing can erase. Mother and child statues are therefore mounted at their abodes as a symbol of hope that it would still be possible for barren women to also bear children

### **CONCLUSIONS AND RECOMMENDATIONS**

The project has led to the production of a semi-abstract statue. Secondly the project is also serving as a source of light to the immediate surrounding and symbolically depicting the affection and the love of women towards their babies. Creating a statute is a three-way conversation between the artist, material and viewer. Material is by necessity at the center of that conversation and it is as much alive as the other two. However, the ultimate aesthetic challenge for the artist is to create form that transcends the material from which it is made.

The transformation of the metal into a work of art, through the magic of welding seeks the idea of transcendence, of opening to another dimension: to a world in which the artist is the master. It is believed that this research will go a long way to prove to other sculptors, metalworkers and lovers of figurative and functional works that exterior sculpture pieces are not always supposed to be static and decorative, but can also be mobile and functional.

It is recommended that when handling normal size human figures that are in a particular posture other than standing, it is advisable to treat the sides and the buttocks as the last to be welded so as to allow the artist join certain hidden parts that would be

very difficult to access from the outside. It is again recommended that other metal sculpture fabricators learn to produce sculptures that come with platforms such as these in order to avoid extra expenses that would be incurred in constructing concrete platforms for every single statue making them static instead being mobile or portable.

## REFERENCES

- Adom, I.H.G. (2014). *General Knowledge in Art for Senior High School*. Kumasi, Ghana, Pp. 199, 204, 217, 294-295.
- Department of Ancient near Eastern Art (2000). "Early Dynastic Sculpture, 2900–2350. B.C.". Heilbrunn Timeline of Art History. The Metropolitan Museum of Art, . . .New York. Ret from [http://www.metmuseum.org/toah/hd/edys/hd\\_edys.htm](http://www.metmuseum.org/toah/hd/edys/hd_edys.htm).
- Fosu K. (2004). *Contemporary Art in Ghana Transition: Samtidskunst Fra Ghana*, pp.83-97, Copenhagen København: Ulandssekretariatet
- Kushiator, G., Howard, E.K., Rahman, A., Quaye, A. H, and Dompseh, H. O. (2019). *Integration of Media Technology: Painting, Photography and Digital Art as Cultural Expressions in Ghana*. Africa Development and Resources Research Institute Journal, Ghana: Vol. 28, No. 6(5), Pp. 1-20, E-ISSN: 2343-6662, 31st May, 2019.]
- Rangwala (2008). *Material Science*, MacMillan Ltd, 124-136.
- Tola M. D (2017). *The Historiography and Values of Statue Construction: Focus on Global Perspectives*. Humanities and Social Sciences. Vol. 5, No. 2, 2017, pp. 53-.59. doi: 10.11648/j.hss.20170502.11