PUBLIC GLAZE CERAMIC SCULPTURE IN MODERN TECHNOLOGY: PROBLEMS AND PROPECTS, A CASE STUDY OF FINE ARTS AND INDUSTRIAL DESIGN DEPARTMENTS, AHMADU BELLO UNIVERSITY, ZARIA

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Abstract
Over time, sculpture and ceramic students from Fine Arts and Industrial Design Departments of Ahmadu Bello University, Zaria have been exploring large ceramic sculptures and mounting them in the sculpture garden and other places for the consumption of the university community and other communities around. This is due to the artistic enormous invaluable usefulness or function these forms play in the society, but most of the time such sculptures do not survive the test of time, thereby posing a problem to the growth, development and advancement of ceramics technology particularly the public glazed ceramic sculpture. Hence, this paper intends to create awareness on the effects of the weather and charts the way forward. The paper also concludes and recommends that, advanced technological materials and equipments should be included in the processes to enable large scale ceramic/sculptures that can withstand the test of time.

Introduction
For quite some time, sculpture and ceramics sections in Fine Arts and Industrial Design departments, Ahmadu Bello University, Zaria, have to some extent been engaging themselves in academic collaborative sharing. One of the major aspects is in materials, particularly clay. Students from both sections produce ceramic sculptures for their assignments and final year projects. Some are with the intention of mounting them in the open for the university community's consumption. Their intention for putting them in the public is for them to stay as long as possible, such that even after years of their graduation; when they come along back, they wish to see that the works are still where they were mounted. Again, if possible, as they come with their loved ones/families, relations or colleagues at their workplace, they should confidently take them straight to the sport, and say this is my undergraduate final year project or my master's project. However, one baffling thing that usually happens most of the time is that, they both come and find the work being washed with rain or some parts dissolved and fell off or pilled off, thereby changing the rendition of the ceramic sculpture resemblance, as it could not survive the test of time due to natural weather, thereby posing a problem; examples are in Figures I and II.

In this regard, the questions that usually come to one's mind are: does it mean that ceramic or glaze ceramic sculptures cannot be mounted in an open place? Could it be that the problem is from the ceramist who

could not do what was required for the work to survive the natural elements? Could it be due to firing and glazing problems? Is it the problem of small size kiln or the problem in the technique of handling big size ceramic sculpture? Are the materials and tools properly used? These and many other probable questions perhaps must have been responsible for the cause of the works not lasting. In most cases, in producing outdoor or public sculpture, artists explore any material of their choice. Some experiment, with concrete, wood, stone, found objects, metal; ceramics (terra-cotta wares), some also glaze their works and so on. Hence the paper intends to create awareness on the alternative ways to tackle such problems.

Clay:
Clay can be defined as an earthly malleable substance or a rock. Artists refer to call clay as a rock, due to the simple fact that it consists of some naturally formed aggregates of the earth (Gukas and Datiri, 2001). Generally, clay is soft when it is wet, and hard which is rocklike when it is fired to a certain high temperature. It has some common characteristics of very tiny sized particles and can be turned around anyhow to achieve a desired form. Nevertheless, geologists have succeeded in grouping these rocks into three convenient groups namely: igneous or granite rocks, sedimentary rocks and metamorphic rocks.

Clay is formed as a result of decomposition of an igneous rock, which is as a result of geological phylogenic actions, that is the mixture of gases and vapor interior of the earth's crust over a period of time which must be about 280 million years (Gukas and Datiri, 2001). Clay can be made hard and permanent by firing in a kiln. The result is known by the Italian words as Terra -cotta (baked earth).

Ceramics
Ceramics is defined as a class of inorganic non-metallic solids that are subjected to high temperature in manufacture and/or use. Ikpakronyi (2012) quotes Singer (1963) that, "Ceramics" is a Greek word "Keramos" meaning "pottery". She states that, the word pottery could also be linked with ceramics. The author adds, that Moses Oladipo Fowowe says the word "ceramics" is used interchangeably with "pottery" and that ceramics has broad definition which includes cement, white wares, die-electric insulators, electronic which include computer, among other technological appliances.

The most common ceramics are composed of oxides, carbides, and nitrides. Silicates, borides, phosphates, telluride, and solenoids are also used to produce ceramics. Ceramics processes generally require high firing temperature, and the resulting materials are heat resistant or refractory.

Types of Ceramics
Ceramics include all objects made from clay which are shaped/formed when wet and hardened by heating (firing). Fired clay has been used to create both functional and decorative objects since the prehistoric era. In general, the higher the firing temperatures, the more durable and less porous the ceramic product can be. The ceramic body can be left unglazed after the initial bisque firing. Glaze can be applied prior to subsequent lower temperature firing. Glazes produce a decorative glassy finish on the ceramic that provides an impermeable coating, to strengthen the ceramic that provides an impermeable coating thereby making it less or even non-porous and thus suitable for storing liquids and for other functions and purposes (Victoria and Albert Museum, 2013). According to Victoria and Albert Museum (2013), ceramics are divided into three main categories-defined by their firing temperature and the constituent's quality of the clay.

Stoneware: It is fired at a high temperature (around 1200^0C - 1300^0C) and varies in colour from light to grey to dark red, depending on the clay. It has a strong, non-porous body. Stoneware can be unglazed or glazed.

Earthenware: It is fired at comparatively low temperature (up to 1150^oC) and ranges in colour from creamy-white to red-brown. The low firing temperature means that the clay particles are only partly fused together and there are spaces (pores) between them.

Porcelain: It describes ceramics with a white body fired at a high temperature. It is also known as the porcelain. It is fired at

temperature up to 1450°C. It has a vitrified (glassy) appearance and is hard, strong and non-porous.

Glaze Ceramics

Glaze ceramics is the layer of glass which is fused or melted in place on the body of a ceramic ware (Gukas and Datiri, 2001). They further state that, there are some relationships between glaze and glass, however, glaze and glass are prepared basically from melting of nearly the same earth substances. The material required for both glaze and glass is silica which could as well be referred to as glass former. Silica has been found to be of the greatest potential because, unlike other oxides, when melted or fused alone and allowed to cool and solidify, it does not re-crystallize.

For traditional ceramics, glaze coatings often are applied to dried or bisque-fired ceramic ware prior to skittering. Glazes consist primarily of oxides and can be classified as raw glazes or frit glazes. In raw glazes, the oxides are in the form of minerals compounds that melt readily and act as solvents for the other ingredients. Some of the more commonly used raw materials for glazes are quartz, feldspars, carbonates, borates, and zircon. A frit is a pre-reacted glass.

Sculpture

Sculpture is a logical process of modeling, casting, carving, constructing and assembling, using: wood, clay, stone, all forms of metal objects, and fiberglass (conventional and unconventional sculpture materials) to create visual objects, either in realism, or non representational in form (Damden, 2008). In general, sculpture is a branch in Fine Arts which is primarily concerned with the creation of expressive form in two or three dimensional. It includes a wide range of different art works extending from free standing (independent) objects through various heights, media, concept and all kinds of relief, either low that are more than raised drawings- high base relief (Biri in Ikpakronyi, 2012).

Sculpture form includes man made and nature made figurines, animals and other forms. The sculpture is executed in various concepts, styles, techniques and media of wood, stone, bronze copper, brass and aluminum of all alloys, clay fiberglass, Plaster of Paris (POP) and so on. According to Abiri in Ikpakronyi (2012), sculpture works have also been produced for indoor and outdoor (public sculptures) and more perishable materials like leather, feather, soap, leaf, wood dust, ceramic grog, even perishable materials like ice, pawpaw, bread, dough, cake, and butter.

Ceramic Sculpture

Ceramists and sculptors, to some extent work hand in hand. They employ clay as their major material to creatively express their indepth creative concepts. Toki and Speight (2004) support that potters and sculptors of the Mediterranean area and Western Asia used clay to form figurines, vessels, and large sculptures.That is why pottery and sculpture are molded or produced by these two artists. However, whether sculpture or pottery or terra cotta, glaze ceramics, once it is fired in the kiln, it is referred to as terra-cotta or ceramic or glaze ceramic sculpture or ceramic wares. Buser (2006) states that ceramics kiln, foundry, or furnace fired both sculpture and ceramics works of any kind. Ceramic sculpture became popular in the 1980s. Some West Coast sculptors have modeled in their own preferred medium of clay, even though they work on the scale of life size. Ceramics can be hand molded, squeezed, kneaded, pinched or shaped with tools or machines into forms, fashioned out of coils or slabs of clay, or thrown on a potters' wheel.

Ceramics is categorically an extension of a different form of pottery making. It embraces all forms of clay wares that passed through heat treatment and the scientific glazing process (Ikpakronyi, 2012). According to Lazzari and Schlesier (2008) and Mittler and Ragans (2009), ceramic wares are universal craft forms found in almost every culture of human kind from ancient eras to the present 21st century. It is an object that is made from clay and hardened by fire. Clay is a natural material found in the ground all over the world. Ceramics and sculpture artists use the same material (clay) to produce all forms of art work which could be functional or aesthetics in nature. These two artists sometimes inter-depend on each other thus meet on the way in exchanging/sharing of

ideas, tools and materials. However, they differ at times in the process of method, production and finishing.

Origin of Public Sculpture

The birth of public sculpture generally appears to emerge in United States. Category (2012) observes that, the earliest commission of public sculptures in United States dates back to late eighteenth century. Such artists include Jean-Antoine. Distinguished United States American former presidents were George Washington, Abraham Lincoln, Thomas Jefferson and many others were produced in ceramic sculpture.

In Africa, particularly Nigeria, it flourished around early 1980s in southern part of Nigeria (Gutip, 1995 and Caligory, 2012). The first set of public sculptures was house posts for the Antiquities department, the Jos Museum, the King of Illa and Ooni of Ife. Others by the Oye workshop sculptors which include reliefs on the chapel doors in 1956, and those of St. Paul's church, Lagos in 1954 and the Ibadan Cathedral doors in 1960. They were the first Royal institutions following Papal Order of Puis xii (Category, 2012). The traditional artists were united to produce public sculptures and crafts, representing Christian themes and stories for the Catholic Church based on the great roles the art works are portraying.

The Function of Public Glaze Ceramic Sculpture

Throughout the age, public sculptures have served as didactic tools for propaganda, symbols of pride offering moral, patriotic and cultural instructions and proclaimed cities as taste masters in civic and aesthetic matters. It has served, and there is still enormous value attached to these public sculptures in centers such as New York, Philadelphia, Washington DC and Richardmond which aspired to have such monument products (Carter, 2012).

Public Glaze Ceramic sculptures in Nigeria: Its Problems

If one has problems with glazing, it is important to study and analyze one's formulae, and later the fired glazed products are very well to try to determine why a particular defect appear when the wares are fired (Speight and Toki, 2004). How the glaze was formulated, how it was applied, and how it was fired may all contribute to the problem (See Figure III)

Public ceramic sculpture is an area that has been explored by various artists world over in order to express their creative and in-depth perception, and mounted in open place for viewers to appreciate just like any other public sculpture produced in other materials such as fiberglass, cement, POP, bronze and so on. Some artists mount their public ceramic sculptures under the shade or corridor and some under the sun, rain and other environmental natural weathering. Some artists like Sam White have produced some outdoor ceramic glazed sculptures to compliment with the landscape environment. It seems the artist must have started somewhere, before getting to this stage of works, probably improving on the process and technique such that the work is able to stand the test of time.

Firing ceramic work is a great deal or serious matter which ceramists need to be extra careful. Probably, that is why Ikpakronyi (2012) states that, in ceramic, it is evident, therefore, that in this field of ceramic art, such countries like China, England, Japan and United States of America went through a lot of transition of improving their process and techniques before eventually gotten to this peak of modern and industrial production. This implies that, their stages of development started from the folk or traditional technique to the improved modern and industrial techniques of 21st century ceramic technology.

The tradition of American ceramics grew from designs and styles from England and Europe; and it evolved through a series of changes as the necessities of the environment forced the early potters/ceramists to be inventive and original. The adaption of local clays and the lack of glazing materials using modern technological machines, the scarcity of skill labour, modern or industrial kiln machines, foundry, the great need for storage containers, new methods for firing and glazing tools and materials, and the test of time and lack of developing new ceramic technological design machines and materials in Nigeria, all must have

contributed to poor ceramic sculptures that could not stand. Their absence could probably be the reasons for not been able to produce public ceramic sculptures in large size and in durable firing that the work can last long under the natural weather, such as rain, sun and so on. All the above issues raised can cause or affect the success of any glaze ceramic sculpture. In Nigeria, it might also have probably been the reason why artists do not want to venture into public glaze ceramic sculpture, thereby making the production very low; again, some glazes are fired at a comparatively low temperature, which makes them Vulnerable to abrasion, thus contributed to the poor production of public glaze ceramic sculptures to be placed in the open places; thereby making it hard for one to see terracotta, ceramics, and glaze ceramic sculptures in the open in Nigeria.

However, on the contrary, in the countries mentioned above, they have access to all these facilities that are seen as problems to Nigerian ceramic artists, particularly those exploring large scale glaze sculptures which involve ceramics process and techniques.
Some of the problems also include the following factors:
-Poor quality clay
-Poor firing quality temperature (no advanced ceramic firing)
-Absorption of water and other chemical in the atmosphere
-Poor improved materials
-Lack of research to improve the process and techniques.
-Lack of collaboration.
-Small scale firing kiln/foundry/furnace

The Way Forward
Toki and Speight (2013) state that, Ceramist had to consider ways to increase his output and subsequently in improvement of forming and firing and glaze firing methods as a greater demand which led to the development of new technologies; and so also should be considered to produce large scale ceramic sculpture that will stand the test of time in twenty-first century.

Firing is a very huge issue in ceramics. It is the backbone in any successful ceramics work whether bisque, terracotta, glaze, either small or large size work of sculpture or pottery. For the purpose of this paper, discussions will ponder on firing large scale or public glaze ceramic sculpture and other issues.

Although most early fired pots and sculptures were probably fired in pits or open fires, some may have been placed in a simple fire-like structure of earth. The changes in firing methods from open firing to pit firing to primitive kilns, which metamorphosed to rudimentary kiln with low wall around the pit, then eventually, the wall was raised higher to protect the ware erratic drafts, finally, evolving into simple kiln that was often left open at the top for loading the ware, then covered for firing. This in turn, led to a permanently covered kiln with a stoke hole at the bottom for loading and flue to allow the fire, a perforated fired-clay floor or pillars on which to place the ware, allow the smoke to escape. In Mesopotamia, it has been ongoing for around 8000 years ago. Variations of these updraft kilns were widely used throughout the ancient world were perhaps as result of lack of exposure

Firing Large Ceramic Sculpture
Firing large sculpture that has not already been bisque-fired required patience and time to raise the heat of a kiln to required temperature and cool it down slowly after firing. As the clay walls of a large sculpture often vary in thickness, it is crucial to raise the temperature of the kiln and to gauge the firing temperature of the kiln gradually, and to gauge the firing time correctly in relation to the sculpture's thickest section (Joki and Seight, 2004). They add that, it is important to preheat a thick piece; that preheating an extremely thick sculpture of 1-3 in. (25-76mm) can take anywhere from 24-48hours, with an additional 120 to 160 hours or more to complete the firing. When firing a work of about 1in. (25mm) thick, the process can easily take 49 hours or more. Figure VI is an example,

When firing, a preprogrammed computerized electric kiln with work that is about 2/8 in. (7mm) thick, use the slow-fire setting, which is generally set by kiln manufacturers as about 12 hours. To dry out ware thoroughly, it is common to use the "ramp hold" mode and programme in one segment. With the kiln lid propped up or the door of a front-loading kiln open approximately 11/2-3in.

(38-76), set the temperature to 200-300 - 93-149 degree fit for about 12 hours. Then go back to the programmed mode and enter a slow setting in which the computer automatically increases the temperature. In a manually operated electric kiln, one can fire any sculpture that will fit in the kiln by turning up each switch-one switch at a time-one notch every 1 to 4 hour until all the switches are in the high position.

In gas kiln, the heat rises to the ceiling, so as the temperature is increased during the initial drying period and through quartz inversion, most of the heat collects in the upper portion of the kiln. As the temperature raises further, the heat moves downward. Therefore, if a large or thick sculpture is being fired, it is best to heat the kiln very slowly until the temperature in the kiln is equal from top to bottom (Speight and Toki, 2004). They further support that, one can adjust the burner by changing the gas pressure by 1/8 in. every 6-12 hours until about 537.7degree ft is reached or the interior of the kiln is red-orange. The temperature could be raised faster with thinner-walled sculpture. Although, a slow rise in the temperature is recommended throughout the entire firing, when using such a long firing period, some ceramists successfully increase the temperature rise per hour, once the kiln has passed through the critical quartz inversion point or after the entire kiln chamber has risen.

As sculpture varies in size so much, each firing has to be planned individually depending on the number of pieces that one will place in the kiln and their thickness. Larger kiln is preferable for larger sculptures or pots because it provides more air space around a piece, allowing it heat more evenly ; this is especially critical during the drying, preheating, and through quartz inversion. The interior size of a kiln can also have an effect on the rate of temperature rise per hour during the firing. It is important to note that, the positioning of the work in the kiln is also an issue to consider, as the heat in different areas of the kiln may vary by several cones.

Electric kilns heat in from the sides and sometimes from the sides and bottom; therefore, because heat radiates towards the center mass of a sculpture, it is important to fire very slowly. Electric kilns with zone control-that is, two or three thermocouples set at the bottom and top, or bottom, middle, and top-sense the heat at each level and relay the information to the computer, which recycles the kiln elements at the section that requires more heat as illustrated in Figures VII and VIII.

The final temperature to which one fires the sculpture depends on the clay from which it is built and the type of glaze. If any, or other colourants to raise the heat slowly, it is equally important to give a kiln loaded with large sculpture a long, slow cooling period, which can extend from one to six days (Speight and Toki, 2004)

Large Glaze Ceramic Sculpture

White (2013) states that, he produces series of large scale glaze ceramic sculpture forms. He states that, he employs the method of land built forms, about 800mm tall; then reductively sculpts at leather hard to echo eroded standing stand in a timeless landscapes. Fired once, slowly in an oxidized atmosphere, before adding a sense of oxides onto the surface to bring colour and tone to the textured surface to emphasize and enhance the strength of the form. Then final firing again in an electric Kiln, fired up to 1200^0C so that the material is impermeable enough to stand up to the nature's elements. White (2013) claims that, as his work always develops and evolves whilst in the process of creating, he is always in the idea of incorporating other new materials, methods and new ideas, such as rusty metal along with site-specific found objects. This is because he often finds it being useful when working spontaneously within the natural landscape. Again, he uses big kilns that would be able to encourage or influence him to create larger scale glaze ceramic sculptures, giving the work a strong visual impact in an outdoor environment. May be, it is this lack of incorporating other avenues of creating public ceramic sculptures in Nigeria that Frey (2013) states that, giant ceramic sculptures of men and women are the underappreciated wonders of 21th century art. In his own approach, he makes his glaze sculpture in sections such that, it fits together like blocks in a stone wall, thereby coming

out with a successful work that is durable when mounted outdoor.

In this present twenty-first century dispensation, to successfully produce public ceramic sculptures that can withstand the test of time, the artists need to resort to other ways that are probably modern. This is to go with the trend of time for effective and successful products that will last for as long as other public sculptures in the society. In the effort to overcome the problems of public ceramic sculpture being washed, cracked and pealed-off, Speight and Toki (2004) support that, they have left the old method and now absorb, change, and adapt to other cultures or approaches, as the use of new methods and equipment are the aesthetic changes that have taken place as contemporary ceramists have adapted the raku method to their work, using what is applicable and discarding what is inapplicable to their own ceramic work (See Figures vii and viii)

The following ways could contribute in keeping the work to stand as long as possible under the natural weather particularly sun and rain. With the emergence and continues evaluation of ceramics and materials world over, the associated materials technologies that are accelerating rapidly and with each technological development, it is pertinent that ceramists should include some of these observations that are on modern facilities in producing public glass ceramic sculptures.

Materials: improved materials, tools and method/process as well as newer technologies that are developed, forming and finishing should be advised to work all ways to meet with the natural challenges. For example, the clay should be properly treated with new materials and tools and also employ new modern processes that are capable of operating under higher temperatures. The ceramists can collaborate with experts in metallurgical department, civil engineering department and mechanical engineering department for their own input particularly in the improvement of the clay and fabricating of tools such as machine parts and so on. In engineering, there are several materials such as Polima (plastic), metal (cast iron) that can aid in large size kiln, furnace, foundry for big size ceramics and glaze products.

Advanced Engineering Ceramics: advance technology is one of the most examples of this rapid and accelerating technological development such as the electronic machine industry. Specifically, is the simple transistor for advancement in ceramics and materials technology, the processes can work well and reduce to push for ever faster, more efficient, less costly production techniques, as the limits of metal-based systems are surpassed, new materials and tools that can conveniently operate under higher temperature, thereby making large scale public ceramic-sculpture that can withstand the natural weather when mounted in the open. With the technological advancement, long life factors and also metal which the virtue of its unique properties, ductility, tensile strength, abundance, simple chemistry, cast of forming and joining can enhance successful production particularly the ceramics that are brittle by nature having a more complex chemistry. The advanced processing of technology and equipment to produce when combined with other materials, such as metals and polymers which can be used as support structure. This combination enables large scale forms/shapes to be produced. With the new development in ceramics particularly the advance engineered ceramics, ceramic chemistry and crystallography, the techniques of phase transformations, alloying, quenching and tempering can be applied to ceramic glaze sculpture so that it can improve the strength quality of the product.

The new and emerging family of ceramics are referred to as advanced new or fine, and utilize highly refined materials and new forming techniques which ceramic glaze sculptors/artists can employ to achieve a successful public sculpture that can last for long without being washed or crack by the natural weather. It is in view of these facts that when these new methods, fabricating tools, materials and processes are used as an engineering material and processes several properties which can be viewed as superior to metal-based system, the work will stand the test of time. There is a close relationship between metals and ceramics in times of their properties.

According to Opoku (2013), Nok art works were properly fired and that is why they were surviving up to time they were dicovered. As such, for the public ceramic sculpture to stand the test of time, apart from the normal firing, a more advanced firing approach should be employed. The temperature should be such that can contain and maintain a certain degree of heat, that even large scale sculpture, it can be able to fire it to a higher point- in a large scale ceramic Kiln, foundry or furnace (Gukas and Datiri, 2001).

The major difficulty with silica however, is its very high temperature melting point. Silica melts at 1710°C; this of course is a relatively high temperature without adverse effects on both the Kiln itself and its furniture. With this heat temperature, it can consolidate into a dense, cohesive body and should comprise of fine and uniform grains known as densification (Guka and Datiri, 2001). For example, Figures i, ii, and iii could not survive the weather challenges; this was due to poor quality clay and firing (Opokwu, 2013). Even though, this artist is bold enough to have attempted producing this large scale ceramic-sculpture.

Conclusion

This paper has been able to identify some challenges encountered by artists and students who have attempted public ceramic glaze sculptures, discussed on definitions, ceramic-terms, and types of ceramics, functions of public ceramic glaze sculpture with examples. This paper is an eye-opener, meant to re-awaken artists in rediscovering the nation's greatest contributions of ceramic technology in the aspect of sculpture, the way for ward, conclusion and recommendations made.

Recommendations

In view of the ceramics and advancement of technology through ceramic-sculpture, the paper thus recommends the following:

-Artists should employ other properties/materials, tools and other facilities so that it will facilitate the success of the work. Particularly, artists should employ advanced ceramics firing processes. The temperature of public glaze ceramic sculpture firing should be improved as recommended by Gukas and Datiri (2001) and Opokwu (2013) that is from 1710°C to 2730°C higher point in other to improve the consolidated strength and density.

-Large scale kiln/foundry/furnace be made or provided so that it can contain large size sculpture work that can be placed in the open.

-Artists need to collaborate with engineers in the Engineering Department such as Metallurgical Department, Mechanical Engineering Department, Civil Engineering Department and Chemical Engineering Department for possible advice on materials, process and tools to be used.

-Engineers can device some possible tools for ceramics firing, for example the fabrication of machines, such that it will go with the new range of firing temperature and new clay materials equipment and facilities. This is because these new temperatures require specialized furnaces and furnace living to attain these high temperatures.

-Students should be encouraged by their supervisors to go into research to get some of the new tools, materials, kilns, foundry and electrical appliances or how to fabricate the machines such that the products can withstand the test of time.

-Some materials required special gas environment such as nitrogen or controlled furnace condition such as vacuum. Other requirements include extremely high Pressures (HIP) to achieve densification. The typical method of these furnaces is gases (Gas plus oxygen, gas plus heated air), resistance heating (metallic, carbon and ceramic heaters) or inductance heating.

-Lecturers should encourage their students into producing large scale public glaze ceramic sculptures in both fine arts and industrial design departments as they collaborate where necessary.

-Clients should give artists commissions to produce public glaze ceramic sculptures, thereby improve upon and learn on the new ways particularly the 21st modern approach and the use of advanced modern technology.





Figures I and II: Bust of M.A. Jaji (left and right quarter views), Terra-cotta, 65cm, Bozimo, 2010
Location: Sculpture Garden, Fine Arts Dept. ABU, Zaria



Figure III: Fountain glaze Ceramic Sculpture, 26 x 56cm, Jonathan Oladele Okanlawon, 2007
Location: Ceramics Section Industrial Design Dept. ABU, Zaria





Figures IV & V: “Head, Hand and Foot”, 26mH, Terra-cotta Abdulrazaq Yusuf, 2006
Location: Between Fine Arts and URP Dept. ABU, Zaria



Figures VI: “Icarus”, Slab Clay, Size & Year: Unknown, Maria Kuczynska





Figures VII & VIII: For loading and firing tall or heavy sculptural pieces or potter, a computerized stacking electric kiln is the convenient solution



Fig. IX, "Hertogenbosch", Glaze Ceramics, 4.26x.73x1.17m, Year Unknown, Year Unknown, John Toki



Fig. X, Juliet Thorn, "Fertility Goddess 11", 12m Stoneware Clay, 12mm, Year Unknown

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