DESIGNING AND USING SIMPLE EQUIPMENT FOR THE PRODUCTION OF CERAMIC BEADS

OKAFOR, N. M.
Department of Fine and Applied Arts,
University of Nigeria, Nsukka
Email: may.okafor@unn.edu.ng

Abstract
Production of ceramic beads can be achieved through a number of ways. Several types of moulds have been developed for mass production of light-weight ceramic jewelries in different industries. In an attempt to make them unique and well finished, designing ceramic beads for jewelries is, however, boring and cumbersome for the studio ceramist. It usually requires stages of creation, puncturing and finishing for every individual piece. This paper, therefore, seeks to invent simple equipment for the studio ceramist to be able to easily achieve desired uniqueness and finishing on beads for jewelries and other accessories. Through well documented practical, designing such equipment and its applications is demonstrated. The paper also reveals possible alternatives in which the equipment can be utilised beyond bead production. In essence, the paper not only exposes the studio ceramist to easier ways of creating jewelries but also to general possibilities in the creation of simple studio equipment.

Introduction
Times before history are today documented through visual images like art works. In various parts of the world, archaeological sites of ancient cultures have uncovered works of art in limestone, rock painting, ivory, marble, stele and ceramics (Gardner, 1980, Kleiner, 2009). Having been fashioned for various purposes by man, works in these materials reveal a lot about cultures and the people who handled them. Ceramics could be said to be the most significant of them since it is commonly ranked as the most ubiquitously found material in archaeological sites (Oluwole, 1991; Speight & Toki, 2004). "In its ability to survive thousands of years, whether in whole or in fragments, without disintegration", ceramics or fired clay has also offered itself as a distinct tool for the archaeologist, ethnographer, anthropologists, and the art historian (Okafor, 2014).

Like ceramics, beads are also scattered around many ancient sites. As Atkins (2000) observed, "archaeologists tell us that beads are found in nearly every culture and every land since the first people walked on earth 40,000 years ago through the present". In fact, recent discoveries suggest a much earlier date, about 100,000 years ago (Geary, 2008). Beads can be fashioned in very many materials and because of their often small sizes, they have little tendency of breakage. Ceramic beads especially, have the ability to survive very many years without a crack. One finds out that a piece of ceramic bead could be created by a generation, used, lost, found and reused by another; and yet another. Atkins (2000) acknowledged that on finding such pieces of beads one may be faced with such questions as "where and by whom were they made? Who has handled and worn and loved them? How old are they? What will their future be?" among others. He further submits that these histories and origins make them magical.

Ceramic beads, as ancient items, have been strung and restrung in several ways. While several researchers and artists such as Benson (1997), Atkins (2000), Cusick (2000), Michaels (2007) and Mitchell and Mitchell (2009) have been concerned with diverse techniques involved in stringing beads and

other components for making jewelries, only very few have discoursed its production, especially in ceramics. In the book, 'Aspects of ceramic History', for instance, Elliott (2006) analysed the studies of Josiah Wedgwood, a scientist and ceramic manufacturer, in understanding the rate of contraction of ceramic bodies in kilns using ceramic beads. Elliott mentioned that the beads were produced through extrusion, an approach employed by many ceramic industries.

Ceramic industries also produce beads using moulds (Ray, 2007). In such cases, clay is directly cast from prepared Plaster of Paris (P.O.P) moulds. This aids mass production and uniformity often sought by industries. Hence, little or no room is created for creative variation of forms; and like extrusion method, it is not common among studio ceramists. The prevalent technique among this latter group is hand forming. In a discussion with Ngozi Omeje, an artist who is known to have based her creative explorations on stringing items including ceramic beads, she said that her only technique used in producing these beads is hand forming (personal discussion with the artist dated June 11, 2014). There is no doubt how much time this artist spends producing these individual beads often composed in thousands to form a piece of art work. She further confirmed that the same technique is employed by almost every studio artist although they approach it in various ways. Hynen (2008), also, wrote how she developed personal hand forming methods after some unsuccessful attempts. She demonstrated the production processes involved in hand-forming ceramic beads and other jewelries; and mentioned that the exciting attributes of beads produced using this technique is in formal variation and irregular features that define studio-made beads. However, she further noted that fingerprints and some other impressions that show they were handmade usually appeared too. Although Hynen (2008) believes that such impressions often add unique features to individual beads, not every artist appreciates them, especially, when they impress accidentally.

Handmade beads are not without other production challenges. In their often small nature, modeling each bead at a time and eventually going through the processes of puncturing and finishing is not just time consuming but cumbersome and boring. Ojie and Esosuakpo (2012) observed that much unlike sculptors and other specialists in art, ceramists are very hardly able to obtain from markets already made equipment for their studio practice. They also observed that high cost of both production and importation for some of them have negatively affected the growth of ceramics in Nigeria. Interestingly, however, Nigerian ceramists have learnt to look inwards in the development of some of these equipment and "continuous improvement for a better life in the last three decades has resulted in tremendous development in ceramic technology" (Ohimai et al., 2012)

In my studio practice, I have sought faster means of producing beads. I sought beyond cast-moulds and extruders since I did not desire much restriction on formal variation. I desired a tool with which to explore forms and sizes and also some level of irregularities that define studio-made pieces. In that search have been developed this simple equipment for the studio ceramist. Below are the materials, formal features required and step by step usage.

List of Materials and Construction

Three basic body parts make up the equipment. They are the tube, nozzle and rod. Choice of materials for each part could vary greatly. Firstly, it is optional to put found objects together with minimum construction from metal or aluminum fabricators. In such situations, plastics, stainless steel, pipes, discarded tubular cans, rods and other scraps could be employed. Secondly, with proper description and measurements one could depend entirely on the fabricators to produce every aspect of the equipment. However be the case, below are the basic materials required for a successful piece.

a. A tube of about 8½ inches tall and 1½ inches wide. Tubular cans or pipes of such dimensions are appropriate. Alternatively, it could be fabricated with metal or aluminum sheets.
b. Thin metal/aluminum sheet of about half foot square is to be used for the nozzle cap, inlet and rod cap. The

inlet could be of any basic geometric shape.

c. A smooth thin rod of about 18 inches length is to be used for handle and the perforating rod which should travel to the tip of the inlet.

When fused together, the three basic components of the equipment listed above should, very necessarily, fit tightly. This prevents each of them from falling off or moving carelessly while using the equipment. If not, the equipment will not only be uncomfortable to use but may result in poor cuts and perforations on the finished work. To achieve such fitting, threads or notches could be introduced as locks to each joining parts. It is also necessary to mention that when the components are fitted, the tip of the rod and that of the inlet should be at same level as shown in Plate 3.

How to Use the Equipment

Step I: On a polythene sheet, roll out well prepared light clay body into an even slab using batons (light clay bodies can be achieved by mixing some quantity of saw-dust with clay). The thickness of the slab should be determined by length of desired beads to be produced. In order words, if beads of one inch length are desired, clay slab of one inch thick should be rolled. Allow slab to set, almost to leather hard stage.

Step II: Detach the rod from the equipment and grease with separator (oil perhaps), using either brush or foam. Fuse the greased rod into position ensuring its tip is at the centre of the inlet.

Step III: Hold the equipment in a vertical position and cut through the slab. This distinctly cuts into the rod in the nozzle the portion of the slab framed by the inlet. Repeat the same process until rod is filled with clay to the cap.

Step IV: Detach rod and gently pull out the rings of clay. Allow to dry (Plates 7-10).

Usually, perforations from the rod do not maintain a perfect centre on each bead (Plate 10). It is, for me, part of the studio touch on these beads since it could create irregularities when the beads are strung into jewelries and other accessories. Again, it was observed that the softer the clay slab used, the greater the tendency of the beads to stick to themselves and will not easily separate when pushed out from the rod (some of those in Plate 9 reveal this). During drying, however each bead detaches from the other. This fact could also be explored by the artist. Introduction of clay slip between the beads could bind as much beads as the artist desires. Hence, during drying and even after firing, slip-bound ones would not be separable from one another, and thus, very lengthy beads could be achieved.

Other Alternatives to Usage

Jessica Italia as observed by Ray (2007) rightly noted that “the true fascination of beads lies in their variety”. Variety of forms could be created by this equipment. As mentioned earlier, for example, thicker slabs could be rolled and cut for longer beads while thinner slabs could serve for shorter beads. Therefore, beads created by this equipment could range from paper-thin to very lengthy. The artist may also explore this variety, creatively, while stringing his jewelries.

Again, for this equipment to produce various shapes of beads, the nozzle has been designed to be detachable. In the description and illustrations above, only a desired size of the circular nozzle inlet was used for simplicity and clarity. Hence, countless alternatives may be explored by the artist while creating inlets. Firstly, a specific shape of an inlet could vary in sizes. For a circular inlet as shown in the demonstration, wider or narrower circumference could be explored. This will, therefore, produce wider or narrower beads, as the case may be and during stringing, such size variation could be introduced too. Secondly, basic shapes of nozzle inlets may also vary greatly. They could range from basic geometry to organic shapes. Figure 2 shows some visual examples. In Figure 2, the artist is presented with variety of shapes and sizes that may be explored while creating nozzle inlets. He is, also, challenged to also create some more to add to his pool of ideas.

Beyond bead production, this equipment can be used to produce other items for making jewelries and some other accessories. For example, while fabricating the equipment, the artist/fabricator may introduce two rods

instead of one. In that situation, items produced will have double perforations.

While stringing the beads, the artist could explore such forms for his designs. Among other possibilities, such forms could serve as grips for two lines of jewelries. While some others (as shown in Figure 4) could also serve as buttons, several of them could fit perfectly as accessories for embroidery and other crafts.

Conclusion

From this work, the studio ceramist producing beads is presented with simple equipment that grants, to some large extent, the freedom to explore diverse forms. The ability to vary inlet shapes and sizes provides lots of possibilities; and the ability to alter the number of the perforating rod extends his production scope beyond simple beads. Moreover, using this equipment permits the artist to produce large quantity of beads in a given space of time. The ceramist does not need extra finishing too, since the beads come out from the rod well finished. Irregularities created by slight shifts from the rod within the inlet during production are also part of the studio excitements on these beads. Finally, this paper challenges the studio ceramist to fashion out more possibilities for which this equipment could serve.

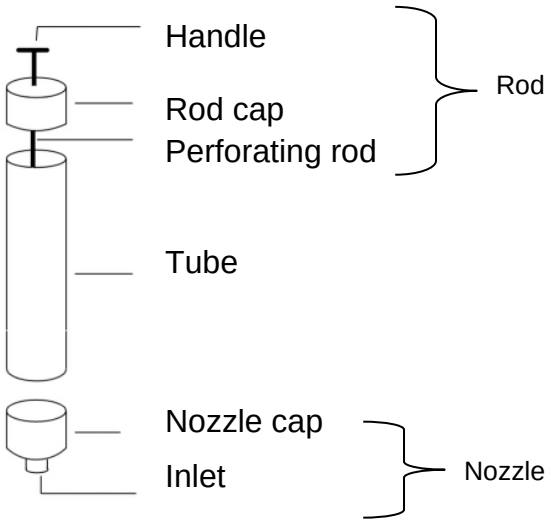

Fig. 1: Various parts of the equipment.

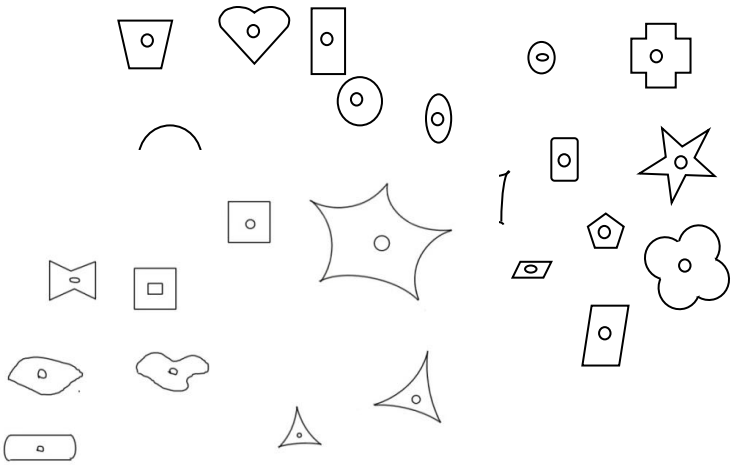

Fig 2: Other geometric and organic inlet shapes that may be explored.

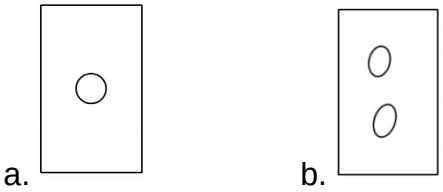

Fig. 3: (a) A perforation from single rod. (b) Perforations from double rods.

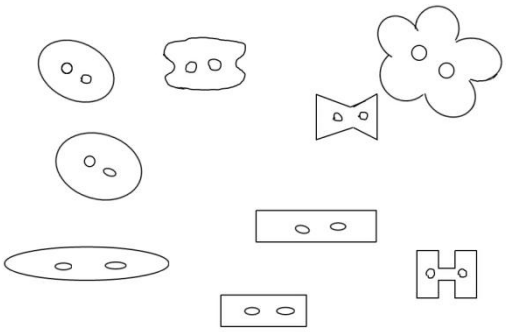

Fig. 4: Various shapes and sizes with double perforations



Plate 1: Separate Parts



Plate 2: Composed Equipment



Plate 3: The tip of the rod and that of the inlet are at same level

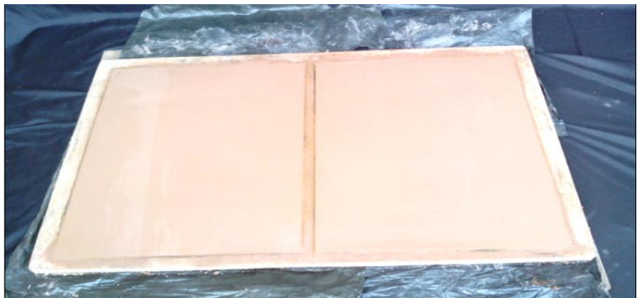

Plate 4: Rolled out clay slab using batons.



Plate 5: Equipment held vertically over the slab.



Plate 6: Repeated cuts

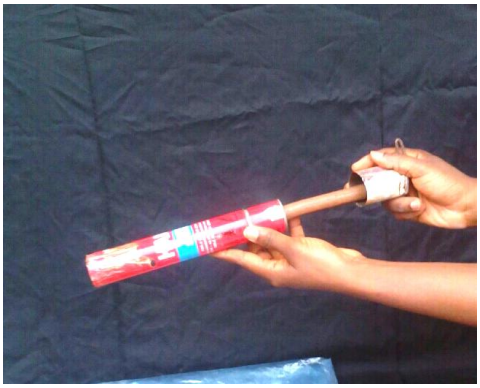

Plate 7: Rod is filled with clay and detached from the tube.

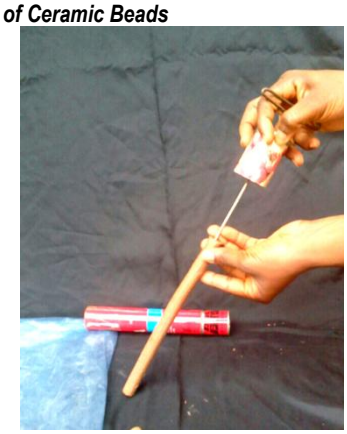

Plate 8: Pulling out clay from the rod.



Plate 9: Rings of clay pushed out from the rod.

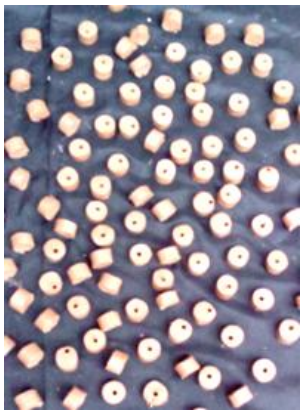

Plate 10: Drying the pieces.



Plate 11: Other alternative shapes for inlets.



Plate 12: Size and formal variations

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