Development of Terracotta Table Nametag for Identification and Office Decoration (Part I)

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Abstract

Polymers, woods, metals, boards (ceiling, particles) are among the inevitably primary materials for production in industries. What materials to choose from when developing a product to meet a client's unique demand amidst distance, limited variety of materials and paucity of literature are the big questions. This study explored clay for the development of a ceramic table nametag. An experimental method in form of reportage was adopted that started with a design briefing. This was followed by step-by-step processes: concept development; preparation of clay slabs; dimensioning of slabs into 14" x 18"; computer-generated design of texts and the university logo composed into a template; a dexterous pressing of a template into the leather-hard surface of the slabs for impression; then dried at room temperature, and fired at 1000^{o}C. The customized terracotta table nametag was polished with wood varnish (commercial lacquer) for glazy effect and mounted on an easel-like fabricated steel stand, and finally presented to the client. Results showed that the significant potential of clay as a suitable material for nametag production. This was revealed in the exciting reaction of the client upon seeing the finished work. It is recommended that design brief should be upheld as a crucial criterion for design is to ensure achievement of the intended goal as client's opinions are crucial, and evaluation of complete should be factored into the design process assess client's satisfaction. The exploration of local content should be introduced to design curricula of design schools given the challenging location of far places such as Adamawa State. Synergy and improvisation are among the design concepts that should be encouraged among designers/artists-students and freelancers for optimal design results.

Keywords: Development, Terracotta, Table Nametag, Identification, Office Decoration

INTRODUCTION

Polymers, wood, metals, boards (ceiling, particle, among others) are among the primary materials that are the ingredients for production in the industries. Yueming (2021) averred that material is the material basis of product composition, and choosing the right one is a criterion for excellent product design, which becomes the basis of the creation and the basic content of the constituent items. Also, Roos (2016) attested that the manufacturing sector is progressively looking to innovation to ensure productivity growth, especially in high-cost operating environments to achieve non-price-based competition. Currently, there is an increase in demand for innovative things, as the traditional rationale for innovation policy has been expanded to more explicitly contribute to tackling societal challenges (Boon and Edler, 2018). Particularly, as the materials, strategies, and technologies exist in especially, art and design production (Kamler and Thomson, 2014). For instance, a graphic design where such concept is applied in experimental work by

resolving ideas and materials that leads to shifting resource-related issues. This is so as production in new media is no longer the province of individual artists or designers working by themselves, but rather involves the collaborative practice of multidisciplinary teams (Kamler and Thomson, 2014).

Graphic design is communication design; an art and practice of planning and projecting ideas and experiences with visual and textual content (Cezzar, 2015). It is also an element that grew from the advent of visual thinking, which is an artform concentrated in the effectiveness of communication through the use of images, words, or other graphic forms (Holifield, 2016), which can be applied in materials - polymers, wood, metals, boards (ceiling, particles, among others).

Perpetually, products made from clay have increased alongside technological and design exploration, which meet people's needs and aspirations; keeping abreast of changes in taste is a vital concern for the current ceramists. This is given the variety of products ranging from arts and design to science and technology nowadays, which expresses the potentials of clay that have long been taken for granted. Clay forms a substantive part of ceramic materials. It is a malleable natural earthly material characterized by plasticity when moistened, but hardens on heating (Pius, 2015), and is used in the making of different items. While ceramics is the craft that deals with the production of aesthetic products, it equally terracotta is an Italian word that means fired earth (Suleiman, 2011).

Conceptual review

Some aspects related to ceramics and graphic design are reviewed to depict the steady relationships existing between them as applied arts; being designed products. These include the common elements and principles in design education where terminologies are used. Also, applied art is dependent on the use of materials and the elements and principles of design.

Product development

It refers to the complete process of taking a product to market; covers renewing an existing product and introducing an old product to a new market. This includes identifying market needs, conceptualizing the product, building the product roadmap, launching the product, and collecting feedback (Sutton, 2021).

Studies abound in the area of product development; for instance, (Schimpf and Flavius, 2010) analyzed the interaction between art and research and development (R&D) through the identification of the role of art in the product development process. Lindahl (2013) described and analyzed how companies develop products that have visual aesthetics as an important dimension: how the dimension of visual aesthetics affects the characteristics of the new product development process; how companies strike a balance between commercial and creative imperatives during new product development; and how companies; source and collaborate using artistic design resources during new product development. For instance, Netto and Kaminski (2004) stated that the fact that design and project, though related, are not conceptually identical shows that it is remarked that both terms stand at the same level when related to the concept of the process.

Design elements and Principles

Design is a term used in the various fields of arts and product invention. It denotes a blend of a noun viz art of design and pattern, and a verb namely planning or drawing produced in showing

the appearance, and function or working of a product before its making. Product design would often emphasize aspects of design elements that result in a good product (Yasin *et al*., 2018).

Design elements and principles help designers to fully understand the relationship that exists among the different sundry areas of art and design. These principles include balance, unity, proximity, contrast, emphasis, and alignment. Analyzing the actual visual design process could bring new knowledge to the field, and would help designers to make optimal design judgments. It also helps researchers describe, and analyze the visual design process to advance the knowledge of the field of instructional design (Tomita, 2015).

Color is the principle of design (Lidwell *et al*., 2015), and is also an element of design. Color has an irresistible effect on the psyche as an essential element of the visual arts such that it affects the aesthetic aspect. For instance, Johannes Itten (https://www.theartstory.org/artist/itten-johannes/), a renowned color theorist, considered it as one of the primary interests of the artist - relating color, the eye, and the brain (Holifield, 2016). Also, the proper composition of a piece of art can communicate several messages by the placement of objects within the picture plane; being dependent on balance to create a cohesive and aesthetically pleasing work of art.

Principles and elements of visual design

They govern the relationships between the elements used in the design, and organize the composition as a whole as the successful design incorporates them to communicate the intended message effectively; help designers organize the images and type to give comfort to viewers and make a greater impact. The principles are - balance, proximity, alignment, repetition, contrast, white space. The elements and principles of design are universal, but designers have different perspectives towards the usage or application (Oladumiyte, 2014). The artistic quality of a ceramic work depends on these design principles. So, a ceramic designer needs to have exposure to the practices of other visual arts such as graphics before developing an art piece of work.

Ceramic Design Elements and Principles

Like other works of art and design, ceramics that can suitably fit into either of the two depending on the application operates with elements and principles of design, thus balance, emphasis, movement, pattern, rhythm, repetition, variety, and unity. As such, this paper would attempt to discuss five identified design elements which include (1) shape, (2) form, (3) color, (4) decoration, and (5) texture. the research approaches via literature review in addition to interviews with the local studio ceramic designers and observations have been used in identifying the design elements of the product (Yasin *et al*., 2018).

Graphic Design Elements and Principles

An everyday approach to exploring visual communication by graphic designers to unleash creativity and important life skills to meet and solve industry problems with solid visual, strategic, conceptual, typographical, and technical skills is worth taking into consideration to help expand the design horizon and meeting industry demands for graphics designers. However, there are some elements and principles of design that have stood the test of time. Some of the graphic design elements are the building blocks of design that lines, shapes, texture, space, size, value, color, balance, rhythm, emphasis, and unity. A simple misplacement of one of these elements may lead to gross misrepresentation or misinterpretation (Oladumiyte, 2014).

Clay as a medium of design in ceramics

In geological terms is a fine-grained, earthy material of an essential component of silica and alumina, which originates from igneous and metamorphic rocks that are ubiquitous (Atkin, 2013). Also, is an earthly raw material known for its sticky plastic nature formed consequently from the alteration and breakdown of the parent igneous rock (Pius, 2015). Furthermore, Quinn (2010) averred that clay is a wonderful and ubiquitous material whose popularity lies in its ability to be transformed.

Properties of Clay

The need for developing nations like Nigeria to explore and exploit their available local content for economic development in manufacturing companies, especially in the face of competitive markets is imperative. And clay has a vast array of unique properties inherent in it too. Some of these properties include according to Ibrahim (2012): Physical properties – being good in terms of density, porosity, hygroscopicity, moisture content and water, resistance, permeability, thermal conductivity, heat capacity, thermal stability, resistance, sound absorption capacity, translucence inter alia. Also, economic characteristics: such as basic manufacturing costs, service life, average annual or other maintenance costs, and applicability to streamlined manufacture and erection.

Clay tablets

The earliest survey of the history of clay tablets revealed that it dates back to when in ancient times writing was done on papyrus, parchment, potsherds, and clay tablets. Personal and business letters, legal documents, books, and communications between rulers are represented (http://www.betnahrain.org/glossary/clay_tablet/tablets.htm).

Terracotta

Terracotta, an Italian term that connotes fired earth (Suleiman, 2011) is iron-bearing earthenware clay that matures at low temperatures and fires to an earth-red color (Atkin, 2013). As an earthenware, it is as glazed or unglazed non-vitreous (porous) clay-based ceramic ware, usually fired between $900^{O}C$ and $1018^{O}C$ (Pius, 2015), with uses in hardware, kitchenware, ovenware, and tile. It is often earthenware ceramics both glazed and unglazed; used to describe the orange-brown color of red-burning clay (Hamer and Hamer, 1993).

The production of terracotta objects is an ancient and very widespread phenomenon globally, and Nigeria, inclusive. For instance, the Nok culture revealed an extensive reliance on clay to produce terracotta figurines (Dokyoung *et al*., 2021), with an absence of their use in table nametag for identification. This study aimed to explore the concept through an array of objectives, thus conducting a design brief, concept development, identification of suitable materials and tools, development and production procedures, and evaluation of the produced table nametag.

MATERIALS AND METHODS

While studio-based experimental technique was adopted for the design and development of the terra-cotta name tag (Egonwa, 2012 and Quinn, 2010): incision, and impression. As part of the development cycle (Lidwell *et al*., 2015), clays ball, and kaolin, were used as basic raw materials while computer set, letter set, knife, brush, cutting wire, ruler, wooden board, were the tools and equipment used in the execution of the project.

Production Procedure

A detail in step-by-step production procedure of the how and with what is explained as described thus:

Step i: Design brief

The information was generated and synthesized from the transpired dialogue between the designers and the client (representative of a Non-governmental Organization (NGO), *Interfaith*, Adamawa Chapter, as a congratulatory gift.

Step ii: Design Concept and Development

The agreed design concept was conceptualized upon the choice of customized ceramics (clay) for the production in the graphic: development of the terracotta table with alphabets and number as elements for the composition based on the realistic concept of the nametag. The concept was developed from a series of preliminary sketches to the final working drawings (see Figures 1a-c).

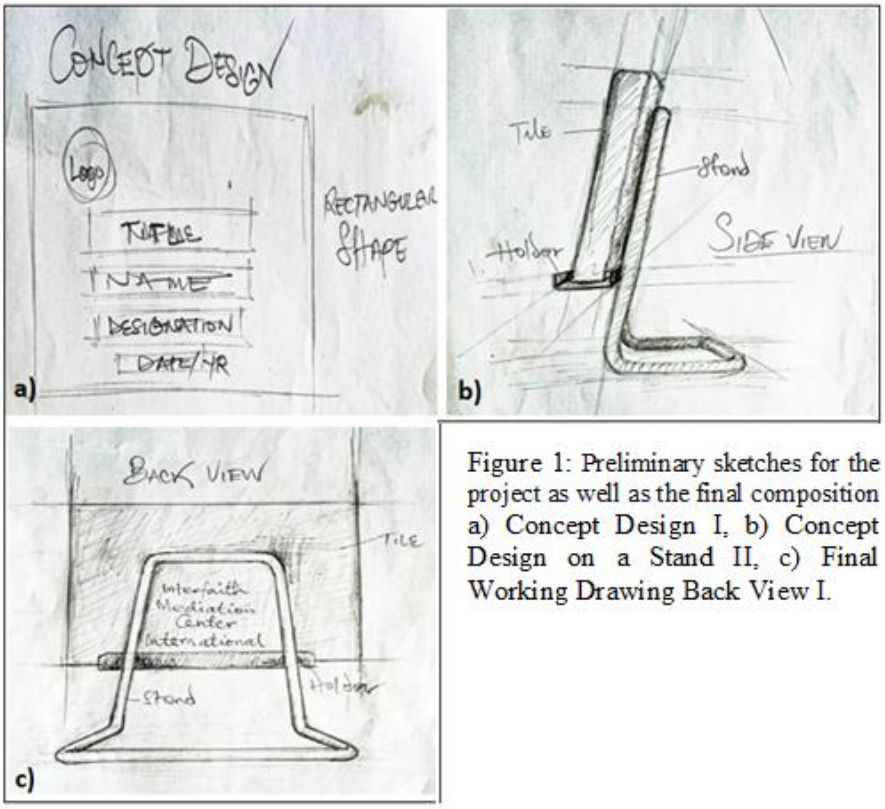

Figure 1: Preliminary sketches for the project as well as the final composition a) Concept Design I, b) Concept Design on a Stand II, c) Final Working Drawing Back View I.

Step iii. Composition of Template

The template was developed from the assemblage and composition of the texts and number selected from the letter sets (see Plate 1a, b) based on the texts and the numbers arranged using scrabble concept; fixed in reverse order on a neon plastic surface using glue to form high relief.

Step iv: Development of clay composite

The clay composite is developed from the concept of line blend, thus, 80% of secondary clay and 20% of primary clay (kaolin). The clays were properly mixed, wedged, and kneaded to form what Atkin (2013) referred to as a homogenous mix, before fashioning the mass of clay into slabs.

Plate 1: Template development, a) Letter set for alphabets, b) Letter set for numbers

Step v: Slab making

The wedged and kneaded clay mass is flattened into a slab using a roller in readiness for the pressing of template/design. This is done upon a prior plan from the design concept as seen in Figures of the preliminary drawing (1 and) to working drawings (3 and 4).

Plate 2: a) Template for Impression, b) Impressed Teplate on Leather Hard Slab

Step vi: Transferring of texts and logo on the slab

The template (see Plate 3) was impressed into slabs at the leather-hard stage (Plate 4) after scaling and setting by carefully calculating the entire layout of texts and numbers using a ruler as a tool. However, the logo was faintly traced from the computer-generated print and incised. Hence, incision and impression techniques were adapted scrabble concept to suit the specific areas in the design to achieve desired results; after well-balanced composition, the background of the clay slab was placed to conform to the template in a unique harmonic manner.

Step vii: Detailing of the texts and logo on leather-hard

The arranged texts and numbers on the templated were impressed on leather-hard state slabs (Plate 4) to achieve the texts and the numbers, whereas the faintly-traced logo was dexterously scooped to create an incision, upon setting the entire composition on one slab; the selected text is to be scooped was done so with aid of the marked outlines, using tools – scrapper, pens, broad blade, sharp, and left to dry before firing.

Step viii: Drying and Firing
The slab was kept on shelves with the back placed on the shelves for proper curing to avoid warpage or crack. These were placed in a warm airy room just to allow the tiles to dry gradually. The dried tiles were placed vertically close to each other on the floor of the kerosene kiln after preheating for 5 hours before it was set at full blast. It was then fired for 12 hours to a temperature of 1000°C based result of the experimental test. The piece was dried and was fired to a bisque stage of terracotta - 1000°C.

Step ix - Assembly and Detailing
The finishing touches of the table nametag were done upon with iron oxide was used for black, red for the project to achieve old-effect effect in the various shades of colors after each stage of firing as seen in Plate 5with a good brushing technique the iron oxide was carefully applied over the terracotta. The work was finally polished with lacquer (varnish) and assembled with a steel easel-like stand made by a welder, and was presented to the client.

RESULTS AND DISCUSSION

The results from the series of steps involved in the execution revealed the desired. This began with the design brief that transpired between the designers and the client (representative of a Non-governmental Organization (NGO), Interfaith, Adamawa Chapter. The interactions led to a successfully working decision synthesized into a guide for the project.

The synthesized concept developed into the series of steps in conformation to the preliminary sketches to the final working drawings (see Figures 2a-d) was successful. This could be attributed to the adaptation of Lidwell *et al.* (2015) process, that is development cycle principle; specifically, the aspect of transforming of requirements to the stage visual form as a for an effective design work.

The choice of clay as material for execution of customized ceramics (clay) table nametag seemed a good one given its suitable characteristics as averred by (Ibrahim, 2012). Similarly, its availability as a ubiquitous material as Atkin (2013) posited is another benefit, hence a germane factor for cost-effectiveness.

The result of the prior planned graphic approach of using letters and numbers deployed was successful. This is because the template was composed from the letterset alphabets and numbers (Plates 1 and 2) did not only guarantee the required exactness and neatness, but it also made the execution of work faster; in line with Lidwell *et al*. (2015) recommendation. Similarly, the use of ready-made letterset as elements for the composition showed tremendous success as compared to the freehand that is more cumbersome. Although, there are arrays of advantages of the, however designer' dexterous discretion is also demanded, which is skill-prone that have to be acquired. More so, the success of the result of the assemblage and composition of the letters/texts and numbers could be ascribed to the adaption of scrabble concept. Although, the concept is easy, however, the challenge in arranging the letters/texts and numbers were in reverse order on a neon plastic surface using glue to form high relief to achieve is a bit demanding.

The result from the choice of clay indicated the desired expectation of terracotta. This in line with Ibrahim (2012) assertion, that clay possess unique characteristics. While the effectiveness of the development of clay composites is based on the concept of line blend, thus, 80% of secondary clay and 20% of primary clay (kaolin) in consistence with Daniel (2009) approach. In addition, the success of the yielded desired quality could be attributed to the thorough mixing, wedging and kneading into homogenous state which is agreement with Atkin (2013).

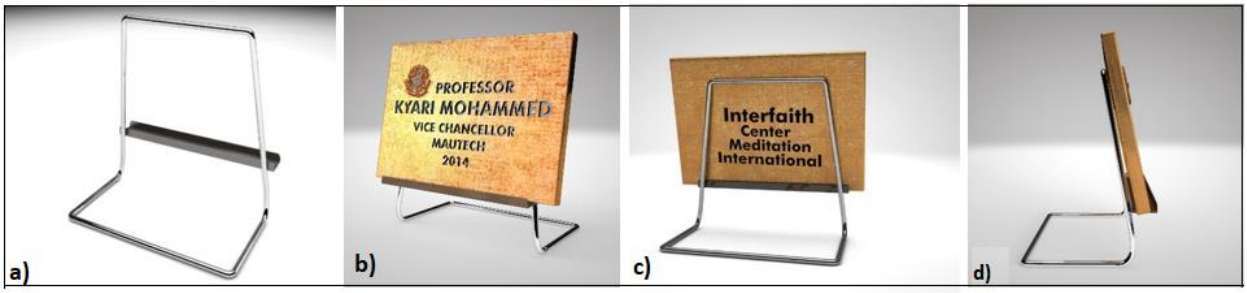

Figure 2: a) A Stand Fabricated from Steel, b) Terracotta Table Nameta at an Oblique Position Showing the Stand, c) Terracotta Table Name tag, d) Sideview of name tag.

The transferring of texts and logo on the slab from the template as impression was successful because of the leather-hard state, which agrees with Daniel (1998). Also, the aligning, scaling and calculating the entire layout of texts and numbers using a ruler as a tool agrees with alignment principle of design by Lidwell *et al*. (2015). This has yielded to effective result as the impression of the plan suited the specific areas in the design. Furthermore, this resulted in a well-balanced composition on the background (clay slab), which conformed to the template in a unique harmonic manner concurring to Lidwell *et al*. (2015)'s design of mimicry – copying properties from familiar things to realize benefits of those properties.

The results from the drying of the slab were also successful having strictly followed the recommendation of (Daniel, 1998) that advocates that slabs/tiles should be kept on shelves with their backs placed on the shelves in a warm airy room and allowed to dry gradually for proper curing to avoid warpage or crack. Also, the firing of the dried tiles in the kiln was successfully as they were placed vertically close to each other on the floor in consistence to (Daniel, 1998) endorsement, and because they were preheated before the full blast firing which is in consistence with general suggestion to ceramists. The target 1000°C of biscuit temperature (Atkin, 2013), which is tantamount to terracotta's was successfully obtained when the work was fired slowly after the preheating it based on experimental test experiences by ceramists/potters.

The assemblage and detailing of the table nametag yielded terrific results in general with the adoption of the concept of finishing touches as opined by Holifield (2016). The success could be attributed to the application of brushing technique of iron oxide was used for black, red for the project that enhanced the desired old-effect of various subtle shades of colors (Plates 2a-c) as recommended by Atkin (2013). Likewise, the use of lacquer (varnish) yielded a glazed-like rendition effect as desired. The terracotta nametag and with a steel easel-like stand made by a welder, were successfully coupled into a unity having had the designers and the welder work hand in hand. The final work (Plate 2d) was successfully presented to the client who had joyful and captivating satisfying reaction. The following findings were obtained:

a) Exploring clay as an alternative material for graphic application widens the scope of the relationship between the design fields (graphic and ceramics); enable students with the concept of using ceramic materials;
b) Potential means of bridging the gap between disciplines via synergy in materials and techniques for innovative work especially, given the current different tools, technologies, theories, and methods, developing hybrid designs and solutions that go beyond anyone discipline;
c) The concept of improvisation of materials is further heightened;
d) Provision a step-by-step illustration is a good guide and can aid a beginner, and inspirational ceramic potters with a wealth of technical details in concept development;
e) Using the rich principles and elements of design helped in achieving the desired results;
f) Provides essential tips and information for designers or entrepreneurs who desire to start a fortunate in this venture;
g) Reveal clay and give insightful clues of clay as an improvisational or an alternative material in practice and sensitization of the concept for graphic production as transitional direction currently present also; especially final year student for his/her project;
h) Serve as a succinct practical guide for students and entrepreneurs who want to explore the potential as background in the visual arts has an important relationship with self-reliance, particularly when meeting clients' artistic needs;
i) Investigate the influence of the firing temperature on the color properties of clays;
j) Solidifies the corroboration of the collaboration of ceramics and graphics, and increase the choice of ceramic materials shown in the reviewed works of Daniel *et al* (2012), Daniel (1998);
k) Design brief helped in achieving an effective result; and
l) The developed terracotta in graphic application stimulates greater interest in the study of synergy, thus deepening the collaboration and corroboration of art and design studies and their connectivity in the template of the disciplines.

CONCLUSION

Though clay is traditionally used for wares such as pots, vases, brick among others, the success of this study opened up an alternative avenue for graphic designers to explore ceramic materials and techniques to create graphic works, hence expanding the scope in other areas of design, such as graphics in ceramics like the nametag. Studies such as this will educate designers on the need to explore local content in research and development. Likewise, the application of design elements and principles as a guide in the execution of the table nametag gave great impetus as the work was appealing or attractive as it met the clients' expectations. In addition, the study strengthened the synergy between ceramics and graphics as a design department. Similarly, future directions are pointed out on the advancement of ceramic materials and forming mechanisms for the production of high-performance graphics.

A design brief is recommended to ensure the intended goal is achieved, especially as the client’s opinions are crucial. Also, assessing the complete product should be factored into the design. Similarly, ceramic and graphic designers should explore the vast potential inherent in ordinary material such as clays (given the ubiquitous nature, huge deposit and their accessibility, and relative cheapness compared to other materials) via synergy for the production of direction signs, numbers, outdoor tile signs for historic places, signage, plaques among others. Also, the concept

of innovation and improvisation should be encouraged, if not, enshrined into art/design students, and freelancers. Furthermore, a reportage of this kind should be encouraged as it will aid students of art/design or developers to know how to record and report a systematic step-by-step production process for optimal reproductivity.

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