

ART AND TECHNOLOGY: ASSESSING THEIR SYMBIOTIC RELEVANCE TO AESTHETIC GROWTH AND DEVELOPMENT IN NIGERIA.

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Abstract

One can argue that art and technology are mutually exclusive, meaning that both complement each other, contrary to the general belief that there is nothing like technology in art or vice versa. Some believe that art is just about aesthetics and little utilitarian importance. Thus, since technology could be defined as a systematic means of making things to help humans change or manipulate their environment to their advantages. There is always a design or element of creativity to aid these technologies. This paper looks at the thin line between art and technology and also brings out the fact that without art and creativity, there will be no technology. It reveals the indigenous technology that is always associated with what is referred to as “local craft” but which can be developed for mass benefit. The paper will recommend the teaching of “art technology,” which should serve as a channel of transforming this so called “local crafts” into technology potentials as a developing nation.

Introduction

Symbiosis is the biological relationship between different living things that live close together and depend on one another in some peculiar ways, each getting particular benefits from the other. It is a relationship between two elements that is to the advantage of both. Bearing this in mind, what is that symbiotic affair between art and technology, even when many people believe that there is a very wide gap between these two and treat them differently? Technology according to Oxford Advanced Learner’s dictionary is “a scientific knowledge used in practical ways in industry for example in designing new machines” it is a practical application of “scientific” knowledge to producing things which will enhance the well-being of mankind. It is a pre-requisite for development and it touches all facets of human endeavours. It is generally accepted that science deals with invention, technology deals with the applicability of the invented products (NTI80-81). Awake states that “technology has found its way into every corner of the world even crossing the divide between rich and poor and has become a part of life for many” (3). For instance, through sciences, electricity was invented but technology provides the use of electricity for its numerous usage such as cooling, preserving, cooking, welding and heating. But then, the products of these inventions cannot emerge without the support of a designer who designed them by laying out a chart on how they can work. This is where art comes in.

The symbiotic relationship between art and technology could be traced back to the early time when men lived in caves. Their drawings and paintings of the beasts they intend to hunt and the design of choice of weapon precipitated the earliest forms of art and technology. Thus art and technology “have complemented each other from the remotest of time” (Bankole 136, Emi 83). Through the dark ages or Medieval and Renaissance periods down to the era of Industrial Revolution in Europe, artists were known to have contributed immensely to the growth and development of technology therefore sustaining a symbiotic relationship between art and technology. According to Oladumiye Bankole (136), Leonardo da Vinci (1452-1519) remains the best example of an artist who has contributed much to advancement of technology. His famous notebook contains hundreds of engineering designs and illustrations especially his efforts at solving the problem of power flight, “which took technology 400 years to implement” (136-137).

Art/Crafts and Technology in Ancient Times

There is a simple technology one can locate in mundane activities such as found in our communities today, such as pottery, bronze casting, iron smelting, sculpture, mat making, basket weaving and blacksmith. This simple technology also plays the role of our cultural heritage or material culture. This is evidently found in the “ornate Igbo-Ukwu bronze of 9th to 10th centuries, which are products of a highly ritualized agricultural society, ruled by a King-Priest” (Dike et al 2). Igbo-Ukwu bronze treasures is said to belong to the oldest known bronze casting tradition in Sub-Saharan Africa. The lost-wax or cire perdue method of bronze casting is a technology invented between 9th and 10th centuries later transferred to the Benin, Ife and Owo kingdoms who used the technique in the “production of the naturalistic commemorative heads and figures of kings and deities in ancient Ife between 12th and 15th centuries and in the alter pieces and ceremonial paraphernalia of the Benin and Owo kingdoms” (2).

Bronze casting is also associated with the people of Nupe with the discovery of some bronze figurines in some Nupe towns like Jebba and Tada. The bronze works is said to belong to Tsoede, the ancestor of the Nupes, who migrated from Idah to the present day Nupe land with that technology (Adepegba 25). The Brass casting is another unique technology found in Bida town of the Nupe Kingdom. Interestingly, art and technological symbiosis in Nigeria could be traced to about the 4th century BC when the iron smelting site was established in Taruga around the area where Nok art flourished and later discovered (Adepegba 4). Iron-working since its discovery has become an imperative technology and basic occupational tools in Nigeria. Such tools include cutlasses, axes, hoes and knives which are still produced by local smith today. Apart from the utilitarian items mentioned above iron object and its attendant’s technology helped people of the ancient time to produce intricate pieces of religious objects with high artistic qualities. Examples of these objects are the “figural staffs or religious significance among the Yoruba and Edo” such as the staff of Osanyin, the Yoruba god of herbal medicines, Orere, the staff symbol of Ifa, the Yoruba oracle and god of knowledge and wisdom and the Osun staffs, the symbol of herbal forces of the Edo people (Adepegba 23).

To buttress the issue at hand it is quite clear that there was a very thin line between technology and art in the ancient time in Nigeria. Archaeological findings have discovered several metal objects of high artistic qualities where artists displayed their artistic smith. These works revealed the total control and knowledge of materials and techniques by these artists. The joining of these metals goes with a lot of ingenuity as they apply several techniques in the

joining process, these include tying, grafting, wrapping and liquid clay otherwise known as mud flux.

David Aradeon (91) also stressed on how the the archaeological findings through various artifacts revealed the creative technologies of different societies in Nigeria in the past, especially in the area of iron smelting and building. These include the excavated tomb of Igbo-Ukwu as earlier mentioned and “the fired and unfired bricks from the excavated cities of Kanem-Bornu (12th-16th centuries) including Mai Idris’ capital at Birnin Gazargamu and his summer palace at Gomboru” (91).

The people of Awka in South East of Nigeria were itinerant black smith who specialized in using both ferrous and non-ferrous metals. Apart from producing objects of domestic importance, these smiths produced religious objects in brass. “These brass objects include bells in bunches to herald the coming or presence of some priest” (Adepegba 23). The bells believed to have been produced through the lost wax method revealed a decorated raised surface of spiral, reversed spiral and other geometric motifs. Neyt and Desirant (206) revealed that there was also artistic iron smithing technology among the Tivs of Benue state. According to them, the Tiv’s metal object are not bells but figures, tobacco snuffs rings, axes and swords, and some of the products paraded by certain chieftains and priests.” The Jukuns also have this kind of axes produced through lost wax technique.

Just like in Bida, where there is the production of objects in beaten sheet metal cast stick-like figures, there are other techniques and production of brass objects. These techniques are found in Kano and Sokoto where “sheet metal is fashioned into trumpets” (Adepegba 23). There are other forms of art works that reveal the indigenous technology of ancient Nigeria, these are pottery, beads making and textiles. Each of those products comes with aesthetic, religious and social relevance while produced with traditional ingenuity. Craft was believed to be “one of the major commercial enterprises, prior to the oil boom era in Nigeria,” and by implication a key player in economic development. This is true, especially in pre-independence/colonial era when, apart from economic relevance, crafts served both “social and utilitarian roles” (8). This was possible because of “the patronage which the craftsmen enjoyed” and the learning of these trades was the foundation of traditional art education whose method of learning involves ascription and apprenticeship.

During the period under review, crafts “were regarded as symbol usually associated with nobility and royalty hence the recognition of the works as Courts Arts objects.” Some of these craft apart from serving utilitarian functions also play aesthetic roles, these can be found in items like Durbar, Boat Regatta and the masquerade paraphernalia.

Because of its increase in demands as basic utilities such as tools, farming implements, household utensils, decorative items, the craft industry has increased and also developed to meet the challenges of increase in demands. So there is this perfection that “is not only reflected in technique but also in the finishing and packaging,” such that local crafts have continued to be relevant both in ancient times and in our contemporary era. Some of our local crafts as mentioned earlier are calabash, textiles, basketry, leatherwork, beads and pottery to mention but few. Calabash decoration is common among the Yorubas, in northern Nigeria, down to the Niger/Benue confluence. This is so especially the Hausas, the Tivs and even the Fulani nomads of the northwestern part of the country. Calabash decorations vary according to these localities.

Textile art is another interesting field with long history dating back to the 9th century AD. Presently, textile art is common among the Tiv, the Hausa and the Yoruba. The Yoruba are

known for their adire and tie and dye while the Hausa and Kanuri are known for their indigo dyed cloths. The Ebira in the north central region are known for their cloth weaving, which functions as a means of expression, especially of ideas, feelings, and thoughts. Textile in the past, also served as currency and means of exchange in transactions (Awe 4).

Basketry is a popular craft. There are 2 types: coiling and stitching and using spokes with weaving. The coiling and stitching type is common in northern Nigeria, while both the coiling and stitching and the weaving types are found in the south. Leather work includes horse-riding, upholstery, cushions, pouffes, hand bags and sheaths for cutlasses or swords, while beads are basically ornamental and used as a means of exchange in transactions. There are beads of different colours. Amongst them are glass beads, which were believed to have been produced in ancient Ife, while Benin is known for coral beads (Adepegba 65).

The terracotta remains of the Nok civilisation indicates that pottery is the oldest craft in Nigeria. Most of the pottery skills are done with hands in the ancient times since there was no evidence of potter's wheels, therefore revealing the creative and technological ingenuity in the past in Nigeria. Probably this is why Michael Echeruo, emphasised that science and technology are "a sub-set of culture"(which by extension include art), just like all other aspects of life were also part of culture (87).

We cannot also underestimate the technological ingenuity in our traditional architecture. Just like every other products, traditional architecture were laden with aesthetic, religious and social relevance. So, there is need to develop an indigenous building technique that will be universally accepted in Nigeria. Because just as Pablo Picasso and other creative revolutionaires adopted the aesthetic values in African art in the early parts of the 20th century, their counterparts in the area of architecture also found their exquisite delight in African architecture. Such person is Le Corbusier. He was captivated by African architecture when he studied them. He "appreciated its principles and features and then transformed them into his own aesthetic and architectural language" (David Aradeon 91).

Art/Crafts and Technology and their modern tendencies.

One of the genres of modern Nigerian art with the most glaring evidence of immense influence of technology is the industrial designs or applied arts. Ekong and Ekong (172) defined industrial design as "the art and science that centre on the creation of machine-made products; for mass productions, and therefore for mass market." Uzoagba (6) defines applied arts (otherwise known as industrial design/art) "as those arts which are concerned with the making of objects to serve a particular purpose or perform a certain function." He goes further to explain that the main objective of applied art is to create "something useful and of commercial value," which could also have aesthetic values (6).

Among the components of industrial designs are graphics art, textile designs and ceramics. The development in graphic art is synonymous with the improvement made on its tools such as cameras, photocopying machines, printing machines and computer (Emi 83). Emi also stressed that graphic art is "the pivot on which all forms of communication by the print media and some aspects of the electronic media such as the cinema and television revolves, and is indispensable to information and education in all kinds of institutions or organisations." He further defines graphic art to "include such art forms as typograph and photography, which are associated with the modern printing press" (83).

The activities and functions of graphic art and artists revolve around the following: production of flip charts, instructional materials, production of hand bills, booklets and posters for dissemination of information and the production of logos, letter headings, signboards, posters, calenders, newspaper advertisement, neon light designs, visual instructional material design, television titles, credit boards design and film editing, sign writing such as the creation of rubber stamps, van display designs, screen-printing on vests, vesolim tapes, plastic utensils like cup, plates and trays to mention but few. Postage stamp, calenders, cheques leaves, money order, currency notes and a host of other items of commerce and industry are all part of it.

Printing technology is another avenue to exploit the symbiotic relationship between art and technology. The graphic artists design while the printing machines do the production. This is the way it works: the layout artist produces series of sketches or rough designs of a product; the visualizer, using the layout as a guide, executes the product's visual and the finishing artist produces the actual artwork with colours seperated in films for use directly at the press for printing the job (Emi 84).

The application of computer to graphics otherwise known as computer-graphics is now the order of the day. The graphic designer or artist can "use the computer to produce a design visual and seperate its colours with no special input from the layout, visualize or finishing artists" (85). According to Kizi Ekeng (2009), technology has made design much easier and has also enhanced proficiency in terms of production output. Ekeng an Industrial designer with proficiency in computer graphic, said that about 8 years back, 80% of graphic production were manually executed but now the case is different. Ekeng who is now proficient in use of coral draw and photoshop said that with technology, production in graphics design and printing now comes with accuracy of placement of image, proper mixing of colour, neat finishing and of course image enhancement in photographic production, by means of digital photography. It is a technology that allows the taking of photographs and transferring them onto the computer system without going through the orthodox film processing. Furthermore, in the area of advertisement, technology has been very relevant in the production of outdoor billboard signs. There are now illuminated outdoor billboards, objects are painted to achieve direct visual appeal by either built in three dimennsional forms like bottles, tinned beverages or tyres and other spherical or cylindrical items. Leather- like fabric known as flexi and PVC are in use now for painting advertisement visuals. Advertisers could advertise on the internet through electronic graphic works. What is more? Relief printing machines have replaced the letter press. Printers such as *201,1860* and *Kord and Sord* "all Planographic printing machines can print several millions of copies of a job of full colour feature in limited time" (Emi 86).

What about photography? It is an off-shoot of technology but an instrument in the hands of artists for creating visual history and literacy. There is also the creation and development of cinematography which is an artistic medium (Bankole 137). Kunle Adeyemi went further to analyse the role of artists in invention/discoveries of technology over the last two centuries. Here are his observations:

There is no doubt that the first urban planner, architect, surveyor,
lithographer, photographer etc,ever known to mankind was an artist...

Vivid examples of these are: Leonardo da Vinci... Joseph Nicephone Niepce an artist in 1813 discovered the art of Heligraphy and in 1826 made the first camera image. Alois Senefelder a graphic artist discovered lithography through the use of limestone... (95).

So, from the above observations “artists investigate, seek, experiment and apply technical knowledge before they produce visible objects” (96).

In the textile industries the artists provide the design while machines carry out the mass production of the designs on fabrics ,of course the ceramics industries are not left out. There is the use of electronic potter wheels instead of the old method of home built pottery and other ceramic items and the use of kiln instead of the local open fire method. Glazing of ceramic materials has provide avenue for the production of industrial materials with ceramic techniques. Items such as toilet facilities apart from the well known kitchen utensils and cups, are products of industrial ceramics. Some plumbing materials, floor tiles, drain tiles, tableware, vase and electrical fittings are also parts of industrial ceramics and a host of other building/construction materials.

What about fine art? In the area of aesthetics, “art which has no other function than the appeal to beauty and emotion” technology is also applied in their production. These include painting, sculpture, drawing, calligraphic designs, printmaking and photography. With computographics, adobe photoshop and coraldraw, artists now paint, make prints, draw and produce calligraphic designs.

Today in Nigeria, there are several companies/organisations that produce the above mentioned genres of art (both fine and applied/industrial arts) in mass. These include advertising agencies, example is Lintas; the electronic media – Nigeria Television Authority (NTA); printing press (both commercial and journalistic) – Academy press and Guardian Newspaper Limited; Textile – Kaduna Textile Limited; and Ceramics – Ikorodu Ceramic Company, just to mention but few. In the area of fine art, there are millions of cyber-galleries in the internet through which an art dealer can purchase or collect works of art or view them.

Challenges

It is Stella Idiong who said, “in the Nigerian society, art and technology are viewed as oil and water which cannot mix,” and further asked “is it so symbiotically precarious that they (art and technology) tend to stand at the opposite pole with one another?” (2). The writer identifies three major challenges to be tackled. They are Education policy/Curriculum implementation; Introduction of Art Technology in schools and Technology Transfer and Adaptation Syndrome. Education Policy / Curriculum Implementation.

Over the years, Nigeria among other African nations, is obsessed with the idea of technology and skill acquisitions which led to the introduction of the 6-3-3-4 system of education. Within this period much emphasis was placed on the sciences to the detriment of the arts /humanities (including visual arts). Art was relegated to the background. In most schools, much money was spent on building science laboratories and so called vocational workshops to the detriment of art studios/workshops which virtually cost less. Most primary and post primary schools lacked well trained art teachers and not all teach art as subject. The case is still the same today. Eventually, the 6-3-3-4 system of education failed to actualize the rapid technology advancement we earnestly desired. Moreover, this move by the government only created “lopsidedness in the treatment of art which now negatively affects science and technology

because it is like placing the cart before the horse” (Idiong 2).Idiong further illustrate lopsidedness in art and technology by exemplifying the production of textile in which the artist designs, scientist provides the chemicals such as dye stuff while the technologist mass produce. All these happened because of the marriage of arts, science and technology but she asked why“these advancement are always couched only in scientific (technology) garments?” Well, that is a food for thought.

In the next curriculum 9-3-4, an off-shoot of 6-3-3-4, which is also just been seriously reviewed/revised, government took a U-turn from the unattained pursuit of science advancement to entrepreneur laden curriculum. The curriculum is divided into two basic form, the basic education curriculum (BEC) and Senior Secondary Education Curriculum (SSEC). The current basic education curriculum was implemented in 2008 under President Olusegun Obasanjo whose government policy thrust was the National Economic Empowerment Development Strategy (NEEDS) focusing on poverty eradication, job creation and wealth generation. (Boco Edet 37). Initially the curriculum had 11 basic areas of emphasis or subjects, these include Value Re-orientation, Basic Science, Basic Technology, Computer science, Teaching of Thinking, Home Economics, Agriculture, Business studies, Civic education, Moral instructions and French with between ten and nine other elective subjects.The reviewed basic education curriculum which is expected to come into effect at the beginning of the 2013/2014 academic session for primary one to JSS I pupils has 10 subjects instead of 20. Apart from the compulsory subject; Mathematics, English, Basic Science and Basic Technology, other subjects made compulsory in this revised curriculum are Religion and National Values, Home Economics, Agricultural science and Social Studies and Security Education. Art is not included, rather Cultural and Creative Arts which comprises of visual arts, theatre arts and music is introduced “as holistic and integrated subject” (Edet 37). Therefore making the subject an elective, though it is common knowledge that art is being taught in most schools today or better still included in school curriculum, yet it is not *uhuru* for the subject. Why? Not all schools teach art. Worse still, art as observed earlier, did not make one of the compulsory subjects of BEC (Basic Education Curriculum), even when merged with other creative arts to form Cultural and Creative Arts (Chukwu and Nnadozie 76).

For any nation to progress technologically there is need to harness the inherent creative and technological potentials in such a nation, principally through its arts. Education is the basic tool to achieve this. Basic art education is goal-oriented education progressing from one level to the next. It teaches children skills in self-expression and capabilities needed for vocational, polytechnic and university education in the chosen art form (www.jstor.org/stable/3331831). By taking art as a subject, children will have a chance to practice some important skills, as well as to promote their potential talents (Chukwu and Nnadozie 78).

What about Senior Secondary education? In the curriculum structure for the 3 year, Senior Secondary Education has 4 distinct fields of study which are compulsory cross-cutting subjects. These are: Science/Mathematics, Humanities, Technology and Business. While offering subjects, it is expected that a student must offer 5 core compulsory cross-cutting subjects, which include, English Language, General Mathematics, one Trade entrepreneurship studies, Computer studies/ICT and Civic Education. (NERDC4). The Senior Secondary Education Curriculum (SSEC) like BEC is also not favourable to effective teaching of arts in schools. In the old curriculum, the core subjects were English Language, General Mathematics, Biology, one Nigerian language, one of Food and Nutrition, and Home Management or Cloth and Textile (instead of visual arts). The same old SSEC, had Cloth and Textile which ordinarily is a branch

of visual arts recommended as part of compulsory elective, instead of a holistic subject- that is visual arts. The worst is to come. In the new curriculum, Cloth and Textile was dropped completely, instead we have English Language, General Mathematics, Computer Science/ICT, Civic Education and one Trade/Entrepreneurship subject. In other words SSEC has four distinct fields of study as earlier mentioned, which include Humanities, Technology and Business studies with 34 Entrepreneurial Trades to provide required skills for creation and poverty eradication (Adegunle Olugbamila 25). Visual arts or creative arts as it maybe is not included, yet the philosophy of this new curriculum is that every senior secondary education graduate should acquire relevant functional trade/entrepreneurship skills needed for poverty eradication, job creation and wealth generation (NERDC 8).

It is imperative to articulate the role the visual arts should play in the revised Secondary School Education Curriculum (SSEC). Visual art as a subject is grouped under the humanities, but it is the opinion of the writer that visual arts should be made compulsory. This is necessary because it will serve as a preparatory stage for students who want to pick any arts/creative related subject(s) of the trade/entrepreneurship subjects as electives or those choosing from subjects under the study field of technology. This is because most of the component subjects under both fields of study emanated from visual arts otherwise known as fine and applied arts. Some of the Trade/Entrepreneurship subjects linked with visual arts include painting and decorating, carpentry and joinery, furniture making, upholstery, garment making, printing craft practice, leather goods manufacturing and repair and photography. Other components of visual arts in the study field of Technology include clothing and textiles, wood-work and several metal works. The writer also observed that there were duplications of the components of the visual arts in these areas of study (Technology and Trade/Entrepreneurship). Why? This is because there are 5 fundamental components of visual arts being taught in Nigeria. These are paintings and sculpture which are sub-grouped under the fine art (these are creative parts that deal solely with aesthetics and decoration) while graphic art/visual communication designs, ceramics and textile designs are applied arts or industrial arts/design. These industrial art/designs and their productions are driven by technology, and they make up most of the elective subjects under trade/entrepreneurship. So if we are clamouring for technological achievement, is it by placing art as an elective at both basic and secondary education school level?

So, instead of 5 compulsory subjects, there should be 6 with visual art making the sixth. It will serve as a preparatory ground for the electives since about one-third (1/3) of the elective subjects originates from the visual arts (fine and applied arts respectively).

Art Technology

Though Art has also been initially tagged with other aspects of vocational subjects like woodwork, technical drawing and so forth, Uzoagba also lamented the tendency among educationist to confuse the values of art and mechanical construction and advised that art and technology should not be treated separately in the curriculum (35). Uzoagba made this clarification in these words:

No attempt should be made to treat art and handicraft [technology] as separate sections of the curriculum. They should both be treated as different media for the expression of the same aesthetic activity, but not as alternative subjects. In industrial production there is no divorce between

form and function... For better industrial production, the sense must first be trained to appreciate the quality in material, the visual proportions in measurement and the tactile relationship of areas and masses. The desire to make beautiful things must be as strong as the desire to make useful things. There must be an instinctive realization that beauty and utility each in its highest degree, cannot be conceived separately.

He further stressed that:

Art fosters very desirable tastes which must in the long run keep up the national level in craftsmanship and incidentally assist in the improvement of many products of industry. (35).

But it seems Uzoagba's advice has fallen on deaf ears as the current Universal Basic Education (UBE) curriculum does not reflect his advice. Instead, we have Cultural and Creative Arts yoked together while vocational education/basic technology forms a separate subject. In some primary and junior secondary schools, we have local Handicraft taught in place of art, and thus increasing the confusion in the curriculum.

At this juncture, it is imperative to remind our curriculum planners and policy makers that "art is the stabilizing factor for technological development" and without creativity there would be no technology because creativity is a by product of art (Idiong 2). Art is important in basic education because art can play a vital role in this aspect since art and technology have a symbiotic relation. There is a thin line between art and technology, without art there will be no technology. The type of technology we need is one that will respond to our immediate need and art is the rudiment our young pupils need to attain such through art technology. (Chukwu and Nnadozie 78). The writer advocates for the introduction of art technology, having considered the yearnings of the Federal Government on the need to produce a generation of graduates that will be equipped with entrepreneurial skills, needed for the eradication of poverty, job and wealth creation, and also government's quest to meet these targets as stipulated as part of the Millennium Development Goals (MDGs), as well as the New Partnership for African Development (NEPAD) and Vision 20:2020 initiatives. The writer is not alone in this vision called "art technology" as he has several visual arts scholars who also share his opinion.

In Uzoagba's case, he termed it "Craft technology," while referring to local handicrafts as a "form of applied or utilitarian art." (169). He emphasized the importance of handicraft in the "age of technology" and handicrafts as "the original plans and designer's factory models...which are made by hands before they are machine-produced," making handicraft an essential part of industry or industrialization. Uzoagba (170) further pressed that his "Craft technology" proposed subject be taught in school. He argued that:

Handicrafts also form an important part of the educational curriculum in many countries. In Nigeria today, local craft is put as a core subject in the primary school curriculum and in the junior secondary school. While art is put in the core subjects, local craft is a separate subject under prevocational elective group.

He further stressed that:

... although local craft has been fully recognized and clearly put as a separate subject of art in junior and senior secondary school curriculum, it is unfortunate that it has not been made a living subject by art teachers in the timetable of most schools...(171).

Well, that has been put to rest with the present revised curriculum for Basic Education and the Senior Secondary Education, but not exactly in accordance with the vision of many stakeholders in the visual arts sub-sector as analyzed in this paper.

In their analysis of the curriculum of Art programmes in Nigerian universities, Akinbogun and Kayode (189) explained that the introduction of Universities of Technology in the late 80s and 90s facilitated a new approach to the teaching of art in the universities with emphasizes on industrial designs. Borrowing from the example of Federal University of Technology, Akure, Akinbogun and Kayode (189) made the following findings:

... the approach in Federal University of Technology, Akure... differs somehow, in the sense that the University wants an Industrial Design Department with the orientation of science and technology, Therefore, prospective students are expected to be profound in science subjects... students may, or may not have offered fine art as a subject in the school certificate at ordinary level. The required subjects are English Language, Mathematics, Chemistry, and two of Physics, Fine Art, Geography, Economics and Biology. (189).

The objective of the above curriculum among others is to “provide students with appropriate training and adequate intellect in the acquisition of skills and technological proficiency necessary for effective translation of creative designs to finished products.” (Federal University of Technology, Akure calendar 2005 qtd, in Akinbogun and Kayode 189). Akinbogun and Kayode were also quick to add that the industrial art/design curriculum in Nigerian universities is geared towards Nigeria’s level of technology which is craft oriented “and not situated in engineering,” instead “the art and design curriculum is supported by courses in engineering and other disciplines.” (190). With this little analysis, it is the view of the writer that the teaching of Art in technology should be seriously considered.

Technology Transfer and Adaptation

The Challenge facing art and technology apart from earlier mentioned education policy/curriculum and the need to merge art and technology in schools is the idea of technology transfer. Nigeria as one of the developing countries in the world is professed to be technologically backward and a mere consumer of technological products. Therefore, in order to develop her technology vis-a-vis her societal needs, technology transfer and adaptation is imperative. This entails studying the technologies of technologically advanced nations like the United State of America, Britain, Japan, Germany. But the question can be raised, are the above assertions correct? Do we really need this so called technology transfer?

It has been mentioned earlier in this paper that iron smelting was established as far back as in the 4th century BC in Taruga. This point is seconded by Ohiare (93) who also affirmed that “iron smelting site existed in Nigeria as far back as 400 BC.” It is from this iron smelting technology that implements such as hoes, cutlasses, knives, weapons such as axes, arrow-heads, traps and guns were manufactured. So why do we need technology transfer and adaptation, when we can improve on the domicile technology bequeathed to us by our ancestors? To buttress this point, this is what Ozovehe (156) said:

We have failed to work to improve on the technology legacy bequeathed to us but rather have through the ages

waited, arms folded, for the nebulous [transfer of technology] from societies that have toiled to develop theirs. It is doubtful if such transfer could ever happen...our technology lacks a source and in want of a channel of transmission. We must come to terms with the fact that the stone of Africa's rich technological heritage which the builders of Africa have rejected must indeed someday become the head of the corner.(156)

Ozovehe, therefore solicited for a technology that is rooted in our creative heritage and insist this can be achieved through effective art education based on strong and pragmatic curriculum.(156). We are in hurry to adopt any form of technology that comes our way, but have we paused to ask ourselves what form of technology is conducive for our environment and immediate needs.

Echeruo once again described the scenario this way:

What we probably need to ponder here perhaps is the apparent tendency among us to take delight in the fruits of science and technology. We should, in this connection ask whether in taking on science and technology, we merely wish to refine our tools [e.g the hoe]... to conquer nature, tame the seasons, dam the rivers, etc. Or are we hoping to alter the basic material goods of life; better air-conditioning and more efficient communications?... (87).

The above analysis should suggest the type of technology arts should encourage and sustain. But then, Nigeria's economic challenges cannot be solved through dependency on imported technologies, equipment and tools alone, neither is it through the local craft technology but turning them into mass production.(Ekong and Ekong 171). That is why our "searchlight should be focused on the nation's indigenous crafts with the view to developing [or improving] on them (175). Because it is easier to develop a technology that had been existing in a given society for years than to imbibe imported ones. According to Ekong and Ekong (175), this contributed to Nigeria's "poor level of technology development... the introduction of innovation in the existing technologies would make the difference." (176).

Conclusion

The writer strongly believes that there could be a symbiotic growth between artistic creativity and technological development. As a developing nation there is that burning desire to attain technological excellence but it should not be at any cost. We must try and look inward and rediscover those craft industries and other local technology which we regard as crude and modernize them to conform with the trends of our time. This we can achieve through making arts and craft an important part of our school curriculum. Charity they say begins at home, millions of moribund local crafts industries that need resuscitation are scattered all over the country. The type of technology we need is the one that will respond to our immediate needs as a developing nation.

Recommendations

- In order to achieve this, there is need to continue to cement the tie between art and technology. There is need for visual arts professional bodies to go into partnership with science/technology inclined professional organizations in order to initiate and jointly carryout projects that will help to expand the role of artists in our contemporary society and help eliminate the gap between art and technology for national development . This will also help breakdown barriers between arts and technology if there is any and expand both the scientific and artistic role in socio-economic development as related to new technologies. Example of this form of collaboration could be between Society of Nigerian Artists (SNA) and Nigerian Society of Engineers (NSE) or even COREN (Council for the Regulation of Engineers in Nigeria), Nigerian Medical Association (NMA), among others.
- Art and Technology could be made an interdisciplinary studio art programme at tertiary education level, but of course in a computer friendly environment were techniques like the usage of digital video, 3D animation, multi media installation and other forms of computer aided creativity could be taught. The programme will help students discover and learn individual aesthetic and artistic history that critically engage the use of advanced technology. This is in the area of either painting or sculpture as well as Industrial Designs.
- Computer graphics should be made compulsory for graphic art students and other fields of Industrial Arts/Designs to help students cope with the computer age. It has been observed that there are a lot of untrained computer graphic “artists or industrial designers” who have all the packaging skills at their disposal to the detriment of non-computer literate but trained graphic artists and this is quite disturbing.
- Art/Craft technology should be taught at basic education level to compliment Cultural and Creative Arts, since it will serve as the preparatory base for the commencement of trade/entrepreneur subjects at the secondary education stage by students.
- Instead of the five (5) compulsory subjects in Senior Secondary Education Curriculum, it should be 6 (six) with visual arts as the 6th subject. This will help the students when selecting electives most of which are components of visual arts.
- Lastly, art should be given equal opportunity with science subjects in the education policy and curriculum, because it is always art before technology and should be taught as a compulsory subject in schools.

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