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# FOCUSING ON GLOBAL TRENDS IN NIGERIAN ARCHITECTURAL EDUCATION: A CASE FOR THE GREEN BUILDING CONCEPT

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**Abstract**
The teaching of architecture as a course of study in Nigerian Institutions dates back to the 1960s'. Although slight changes were being effected in the ensuing years, the curriculum on architectural education has largely remained the same. With the advent of globalization in more recent times, however, architecture has been presented with new opportunities, challenges and trends. This paper identifies one of such contemporary issues as the green building concept. The concept, developed as a reaction to the global outcry on the negative impact of buildings on the environment, imbibes eco-friendliness as its prime design philosophy. This paper however observes that although the green building concept currently attracts a tremendous amount of attention at the global level, the concept has not been commensurately reflected in the curriculum of architectural education in Nigeria. The paper therefore recommends a review of the curriculum to meet the new challenges and opportunities presented by the green building concept. This it believes will keep architectural education in Nigeria abreast with an issue of current global interest and consequently enhance the global relevance of the Nigerian graduate architect.

**Keywords:** building, concept, global, green, trends.

## Introduction

Architecture has been practised for thousands of years, influenced over time by religion, politics and society, art, science and technology and responding to landscape, geology and climate. For almost the entirety of its history, the field of architecture has relied on the transmission of its knowledge through a chain of masters and pupils in webs of personal contacts, to reproduce itself. In traditional African societies, teaching and learning in the building trade was secretive and often shrouded in mysticism. According to Ob'lama (2006), the profession was regarded as a family tradition, the mastery of which was believed to be more genetically inclined, than of ordinary talent. The French state however created a new method of knowledge reproduction in the early nineteenth century with the formation of a school intended to train architects, the École des Beaux Arts. Today, the field's reproduction system is completely institutionalized, through a formal system of education which is properly located in institutions of higher learning. In Nigeria, architectural education has been on an evolutionary trend over the years. From one school of Architecture in 1962 to three in 1970, ten in 1987, fourteen schools in 1991, to about seventeen universities and twenty polytechnics today (Mogbo, 2001; Anunobi, 2006).

In this period, there have been phenomenal changes in all human societies requiring commensurate changes in the education and practice of all professions (Sumaila, 2006). Very prominent among these changes is the advent of globalization, a

term which has come into common usage since the 1980s, and reflects the technological advances that have made it easier and quicker to complete international transactions. Another issue which has thrived within this period has been that of the rapid depletion of the earth's resources, and the consequent endangerment of the global environment.

Since globalization has succeeded in compressing the world into a global village, signals of such environmental stress travel faster, bringing about an increase in environmental consciousness. This consciousness has in the field of architecture, translated into the adoption of green or eco-friendly building designs, a building design method which seeks ways to build without further depleting the environment or dwindling the available resources from nature.

The purpose of this paper therefore is to find ways in which architectural education in Nigeria can be structured to keep abreast of the alternative design methods being employed by present-day architects in resolving environmental sustainability problems. The paper suggests a restructuring of the existing curriculum to accommodate ecological literacy, such that a deep understanding of the relationship between nature and design can be achieved.

**Literature Review**

Change is a constant in the relationship existing among the variables of any human endeavour. Architects as professionals must imbibe the culture of training to be relevant to the wider society within the ever-changing circumstances. Curriculum review is one approach that makes the training of architects potent in the realm of competing problems of the ever-changing times. (Ukanwa, 2004). No one can deny that when it comes to the environment, buildings are right up there with automobiles as polluters. Air-conditioning wastes large amounts of electrical power and toxic ingredients leach from building materials and foul the air. Thirty years ago, only a few environmentally-minded architects cared about such things. Today the application of environmentally conscious construction methods and materials has become the norm in buildings.

The curriculum of architectural education must therefore be restructured to reflect these changes. Some proposals by other authors are discussed here. Sumaila (2006) suggests that since the issues of sustainable development and environmental conservation are central to the profession of architecture, they constitute an area in the expanding frontier of knowledge for the architect and should be appropriately reflected in the curriculum. Anunobi (2006) posits that a lot of concern is today being expressed over the earth's dwindling resources, so the subject of energy management and conservation is becoming increasingly important. According to him, since much of the energy consumed is used in buildings, architects who design these buildings must make their educational curriculum consider it. Sartor (2007) posits that with the twenty-first century's acknowledgement, and implementation of "Green technologies" and "Sustainability strategies" in the built environment, potential design professionals need to be re-educated in interdisciplinary knowledge domains that affect Architecture. He focuses his studies on the emerging environmental curricula in an architectural program at an Evangelical University that has embraced environmental stewardship as a vision and mission emphasis.

**GLOBAL ENVIRONMENTAL TRENDS**

One of the greatest challenges facing Mankind in the greater part of the 21st century has been that of conserving and


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maintaining the purity of the environment. The human race has been overwhelmed with warnings about the calamity that may follow if necessary steps are not taken to reduce the negative impacts that technological changes arising in part from globalization, may bring to bear on the global environment. (Gasu and Fadare, 2005). Transport technologies, for example, have not only made the world a smaller and more "global" planet, but they have also resulted in new environmental stress, especially through increased atmospheric carbon concentrations (Najam, 2007).

Although environmental problems are not new in themselves, industrialization and rapid population growth have greatly increased the scale and intensity of the over-exploitation of natural resources and environmental degradation, generating a wide range of urgent global concerns (Olayode, 2005). For example, while the global population doubled between 1950 and 2004, global wood use more than doubled, global water use roughly tripled, and consumption of coal, oil, and natural gas increased nearly five times Based on current projections also, humanity will be using two planets worth of natural resources by 2050 – if those resources have not run out by then (Najam, 2007). From this data, it is evident that humanity's ecological footprint—the demand people place upon the natural world—has increased to the point where the Earth is unable to keep up in the struggle to regenerate.

These ecological footprints have culminated into International environmental issues, which according to Greene, 1997; and Olayode, 2005, are divided into the following nine categories. These are: (a) Global warming; (b) Ozone layer depletion; (c) Acid rain (d) Disappearance of tropical forests; (d) dwindling varieties of wildlife; (f) Marine pollution (g) Trans-boundary movement of hazardous waste; (h) Desertification and (i) Environmental pollution in economically developing countries. With such staggering statistics and information staring various governments and nongovernmental organizations in the face, the need to preserve our planet from self-inflicted extinction has pushed global environmental issues and conservation strategies to the fore in major global discussions.

**The Green Building Concept**

Buildings are the structure of the modern world. They represent society's ingenuity and ability to manipulate our environment into forms that serve our purpose. According to Roodman and Lenssen (1995) however, buildings consume two-fifths of world energy production. This does not include the energy that is required to harvest, manufacture, and transport all the materials used to construct and maintain buildings. One-sixth of all water pumped out of natural flows is consumed in buildings. One-quarter of all virgin wood harvested ends up in buildings. And this does not account for all the interior wood furniture. Combined, buildings form one of the major catalysts for environmental degradation on the planet. Rather than fight nature, therefore, the best of new architecture now uses it to solve environmental sustainability problems.

According to Haruna (2006), more and more architects are meeting stringent environmental criteria. They are becoming adept at applying technologies that deplete fewer precious resources, generate less toxicity, and threaten fewer habitats. However, thinking ecologically about design is certainly not a "new" idea. Since ancient times "designers" looked to nature for "solutions" to their common problems; they saw nature as the perfect model to

follow. More recently, designers such as Le Corbusier and Frank Lloyd Wright, among many others, have attempted, with some degree of success, to address ecological issues through their designs (Lomba-Ortiz, 2003). A green building according to the Wikipedia Encyclopedia therefore, is the practice of increasing the efficiency with which buildings and their sites use and harvest energy, water, and materials, and reducing building impacts on human health and the environment, through better siting, design, construction, operation, maintenance, and removal — the complete building life cycle. In addition to sustainability, another common goal of green building is aesthetic harmony between a structure and the surrounding natural area. Other commonly used terms include sustainable design and green architecture. Material selection is one of the most visible green building strategies and often the easiest to point to, but a green building designer's checklist should also involve the following considerations:

- **Save Energy through the Design and Building of Energy Efficient Buildings.** The energy use of a building constitutes probably the single greatest environmental impact of a building. Green buildings should therefore incorporate passive energy-conserving strategies responsive to the local climate.
- **Recycle Buildings.** Historic buildings should be reused whenever possible to assist in their preservation. In some cases, the workmanship and quality of materials that have gone into them are almost impossible to replicate today, making the restoration all the more valuable.
- **Reduce material usage**. No matter what the materials, using less is almost always preferable, as long as the durability or structural integrity of a building is not compromised. The designer should strive for "smaller is better", optimizing the use and flexibility of spaces, so overall building size and the resources necessary for construction and operation are minimized.
- **Protect, Preserve, and Enhance the Site through the restoration of the local ecosystems and biodiversity.** In fragile ecosystems or ecologically significant environments, this might be the highest priority. The designer should consider the building/land interface to minimize disturbance to site character, skyline, vegetation, hydrology and soils. Disruption of wildlife travel should be avoided by sensitive siting of development, and by limits set on construction activity and facility operation.
- **Select and Specify Low-Impact and Low-Environmental impact, resource-efficient materials.** The designer should avoid the use of energy-intensive, environmentally damaging, waste producing and hazardous materials. Materials produced from waste or recycled materials should rather be specified. Cradle-to-grave analysis in decision-making for materials and construction techniques should be applied. This "cradle-to-grave" analysis is the tracing of a material or product, and its by-products, from its initial source availability and extraction, through refinement, fabrication, treatment and additives, transportation, use, and eventual reuse or disposal.
- **Design for durability and adaptability to maximize longevity.** Designing and building a structure that will last a long time necessitates addressing how that building can be modified to satisfy changing needs. Allowance should be made for future expansion and/or adaptive uses with a minimum of demolition and waste.

Consideration should be made for aesthetics during design, and whether a particular style is likely to remain popular - the idea of "timeless architecture."

- **Design buildings and landscapes that are water-efficient.** The designer should Locate and design facilities to minimize erosion and impacts on natural hydrological systems. Hydrological systems should be safeguarded from contamination by development/activities. Allowance should be made for precipitation to naturally recharge groundwater, wherever possible.
- **Provide a safe and comfortable indoor environment by making the building healthy.** The health of the building occupants should be ensured in any "sustainable" building. The steps which the designer could take to facilitate this include; avoiding mechanical equipment that could introduce combustion gases into the building. Avoid building with materials that have high rates of VOC off-gassing such as standard particle board, some carpets and adhesives, and certain paints. Controlling moisture to minimize mould and mildew. Introducing daylight into as many spaces as possible. Maximizing ventilation and inducing airflow around the facility. Giving occupants some control of their environment with features like operable windows, task lighting, and temperature controls.
- **Return, reuse, and recycle job-site waste.** In striving for minimal material waste, the designer should identify opportunities for the reuse/recycling of construction debris.

**Contemporary Features of The Architecture Curriculum in Nigerian Universities**

While the focus of education and instructional methods in most other professional disciplines are clearly defined, the architectural profession is still embattled with the problem of appropriate education. There is continuous controversy as to the appropriateness of teaching methods and the relevance of architectural curricula to the needs of today (Adeyemi, 1990; Oluigbo, 2005). A comprehensive definition of curriculum according to Solanke (2001); Anunobi (2006), includes the goals, objectives, contents, processes, resources and means of evaluation of all the learning experiences planned for study both in and out of the school/university classroom. Although the early curriculums were patterned to suit the British model, the current curriculum of schools of architecture in Nigerian universities is based on the Nigerian Universities Commission (N.U.C.) Minimum Academic Standards and the slightly different Nigerian Institute of Architects/Architects Registration Council of Nigeria (NIA/ARCON) Approved Minimum Academic Standards (Sumaila, 2006). Apart from peripheral courses in English, Mathematics, Physics and General Studies courses at the lower years of architectural school, the core components of the architectural education curriculum in Nigeria are (i) History and Theory of Architecture (ii) Architectural Design (iii) Urban and Regional Planning (iv) Structures and Building Technology (v) Construction Components and Methods (vi) Construction Materials Science (vii) Professional Practice, Ethics and Procedures (Anunobi, 2006). From the data provided above, the curriculum as it currently exists is devoid of courses targeted primarily at sustainable development and the related issue of

environmental conservation which are of current global concern.

**Greening the Architecture Curriculum**

Perhaps, no century in history has thrown up as many challenges to architects and environmental managers as the twenty-first century. Not even the industrial revolution of the eighteenth and nineteenth centuries was as demanding (Anunobi, 2006). According to Sa'ad (2001) therefore, community development, ecology, environmental protection, preservation, design review, conservation and restoration have become very prominent considerations in architectural practice.

Training of modern Nigerian architects must take this into account; otherwise, Nigeria might not be able to produce architects that can work in other parts of the world i.e. world-class architects (Anunobi, 2006). One way to do this is by giving the present curriculum a more 'sustainable development conscious' outlook. Such a development might also be termed 'the integration of ecological literacy into architectural education', to keep architectural education in Nigeria abreast with current global trends. Education for sustainability will enable students to develop a personal critique of society and produce graduates who are ideologically aware and socially critical. If students understand sustainability as an aspect of their social and ethical responsibility, they will become citizens who see themselves as connected to the natural world and other humans. They will have the capacity to facilitate the development of activities that sustain rather than degrade. The recommended strategies include:

1) Emphasis should be laid on 'Architecture for Generations': Previous generations of architects designed for centuries; today's projects are often designed for decades. Sustainable design requires a commitment to longevity.
2) Educational innovation must embrace post-occupancy evaluation: For the profession, this area is emerging as a new service and important area of monitoring and interpretation that has long been undervalued. Design consciousness should be raised about performance and sustainability over time, design improvements, design for flexibility and adaptation, and design for diverse occupancy needs.
3) The architecture of place: Knowledge of climatic, geographical and cultural diversity and expertise in the region of practice is critical to sustainability. The identification of courses that champion regions and cultures and embrace the liabilities of climates and natural conditioning assets will be key to curricular innovation.
4) Developing Daylighting and Systems Laboratories: Daylight is a significant driver of ecological design and measurement is key to understanding. Every school of architecture should have daylighting and/or integrated systems labs of the highest calibre.
5) Promoting Sustainability Demonstration Projects: Schools of architecture should seek the support of Government agencies, such as the Education Trust Fund (ETF), or partner with interested corporate bodies to promote a fully funded sustainable design project.
6) Ranking Architecture Schools by Levels of Ecology Literacy: The Nigerian Universities Commission (NUC) and the Nigerian Institute of Architects (NIA) have been responsible for the academic and professional accreditation of Nigerian schools of architecture respectively. It is recommended that both bodies include among their various

accreditation requirements, the number of required and elective courses, dedication to ecological literacy and other sustainability issues.

7) Grants to Educators: Schools of architecture should prevail on their parent universities to set aside funds to finance approved proposals from educators who intend to carry out research on ecological literacy in architectural education
8) Journal of Ecological Literacy in Architecture Education: The possibility of a peer-reviewed journal, focused on teaching ecological literacy, ecological design, environmental systems, and other related courses in architecture education could be explored by Architectural Educators.
9) Providing ecological literacy resources: Universities should endeavour to equip their libraries with sustainability references, DVDs, and software.
10) Hosting Workshops: Architectural schools should design and facilitate educational workshops with the best ecological thinkers and practitioners to reveal the breadth and depth of courses, curriculum, tools, and innovation for sustainability.

## Conclusion

Since the emergence of the first Nigerian school of Architecture in 1962, there have been phenomenal changes in all human societies requiring commensurate changes in education. One of these changes has been the rapid depletion of the earth's resources, and the consequent endangerment of the global environment. This has resulted in greater global environmental awareness, which has fostered the green building concept in architecture. This paper however observed that this current global architectural trend aimed at achieving sustainable development in the environment is yet to be commensurately reflected in the curriculum of architectural education in Nigeria. This paper therefore proffered suggestions that it believes when applied, will keep the architecture curriculum of Nigerian universities abreast with global 'green' and sustainability conscious trends.

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