

## USE OF COMPUTERS AS ALTERNATIVE TO DRAWING BOARDS FOR THE TRAINING OF ARCHITECTURE STUDENTS IN NIGERIA

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**ABSTRACT:** *The direct influence of computers is now universal. Computers are used in applications as diverse as running a farm, diagnosing a disease, designing and other life endeavours. Architecture is a course that cannot be left out in this global struggle to attain greater efficiency and scientific precision in its outputs. Various computer software have been developed for architectural designs just as there are various types of computer hardware suitable for different purposes. The paper examines the use of computer for architectural design at all levels as alternative to use of drawing boards. The paper sees the tool as efficient for the training of architecture students and calls for replacement of drawing boards with computers. By so doing architectural designs could be presented and assessed with computers as the trend in this scientific dispensation.*

**Key words:** *architecture, computer, drawing board, software, training*

### INTRODUCTION

Architectural education began in a formal setting in the 17<sup>th</sup> century in Europe but prior to that time it was learnt by apprenticeship under the tutelage of a great master (Olotuah, 2006).

Training of architecture students in the formal setting employs the use of drawing boards and this has recorded tremendous success. In Nigeria the first school of architecture was established in the early 60s and drawing boards have been in use since that time. The use of drawing boards studio in Nigeria schools of architecture therefore continues unabated. Despite the success it had recorded in the past the emergence of computer and its advancement has gradually rendered drawing boards obsolete in the ICT dispensation.

The continued relevance of computers for training of architecture students has been a subject of heated debate in the past two decades. This had necessitated the convening of several conferences by Nigerian Institute of Architects (NIA) and commonwealth Association of Architects (CAA) in the past and recently the Association of Architectural Educators in Nigeria (AARCHES) held two separate conferences in February and October 2006. Many

institutions continue to rely on hand drawn architectural drawings and some schools of architecture even prohibited the use of computer-aided drawings (Salisu, 2006).

There are 20 Universities and 17 polytechnics training architecture students in Nigeria and none has fully embraced the use of computer for the training of architecture students. Computer has become an inevitable tool of development in contemporary Information and Communication Technology (ICT) age. Unfortunately schools of architecture in Nigeria train students with paper, pencil and ink. The products are totally inadequate when confronted with digital computers. Colonial architectural education concept has been overtaken by ICT revolution. The success of computers is tremendous, obvious and positive and architecture students should not be exempted from these benefits. This paper opines that schools of architecture have taken too much time to fully digitalize.

### PROBLEM OF DRAWING BOARD DESIGNS

Architectural design is the core and most important course in the study of the discipline. The entire architecture programme culminates in the design studio since all learning in architecture are geared

towards imparting such skills in the students as will make architecture students competent in the effective shaping, reordering and articulation of the built environment in its entirety (Olotuah, 2000). This adduces the reason why a graduate of architecture must have passed architectural designs of not less than 46 units from not less than a total of 164 units (Obinna, 2004).

The basic problem of drawing boards design lies in the fact that every aspect of architectural designs are manually produced thereby making it tedious, time consuming and lack of precision and accuracy when compared to drawings generated by Computer aided design programme. Many drawing materials are employed before a complete drawing is produced manually and alterations/editing are made tedious. Poorly represented graphics are easily identified and functional design could easily be underscored on the manually produced architectural design. The consumables in hand drawn design are replaced at short time intervals and a lot of wastes are generated.

The task of carrying drawing board and drawings in portfolios are eliminated in the use of computers as flash drives and compact discs are adequate portable medium of storage for computer data. The presentation of data collected and the amount of time and resources spent to obtain it reduce the interactive ability of the student. These narrow the ability to grasp the substantial information derived to mere graphical representations of data with little or no use of its inputs to the design in question. Architectural design mentors spend a great time and energy with students to establish the link between information derived from data collected and the design forms generated. Rapoport (1984) argues that overemphasis on studio isolates architecture students from the rest of the university and denies them of the time to carryout scholarly research and acquire equal knowledge in other disciplines relevant to architectural practice. The concept of using computer for architectural design eliminates manual skill in terms of graphics, architectural delineation and scientific precision.

### COMPUTER AS A DRAFTING TOOL

The commercial version of CAD was introduced in 1983 using the Disk Operating System, (DOS). The DOS is not user friendly as all the command prompt had to be learnt by heart by the operator. This led the CAD software to be prohibited in the training of architecture students as it was strenuous, time consuming and uninteresting to operate (Salisu, 2006). In 1995, a break through was recorded in the introduction of Windows 95 a user-friendlier interface of CAD software. Most commands are merely picked by clicking at it in the menu. This further attracted users to the CAD software and many architects especially those in the practice adopted the use of computer to produce sketch and presentation designs.

Other unique features of using computer as a drafting tool are:

- ✧ Most software drawing tools and commands are user friendly and easier to understand.
- ◇ Interactive modelling and animation library that are available in the CAD software enhance study of form, space lightning and other features of architectural design.
- ◇ Computer Ease the integration of CAD software with any other computer program for clarity of expressions.
- ◇ Editing design or correcting mistakes in a design is almost immediately with computers.
- ◇ Drawing graphics are neatly expressed and
- ◇ Use of computers eliminates the problem of students with poor graphics but with good creativity in architectural design.
- ◇ Architecture students are exposed to different approaches to design with computers.

### DESIGN PROCESS MADE EASY WITH COMPUTERS

Architecture is the study of orderly and sustainable environment for human habitation in line with their socio cultural

heritage (Abdulkarim, 2005). This, he explains, is a confluence of arts and Science, and primary facts and figures, which form the basic for starting any architectural design project. Here the students went for data on various aspects of the project and use the information as design inputs. The art is about expression of beauty or style in visual form. This is expressed in the building façade using form, texture and colour. These are split to stage by stage in which the contents are interdependent until the design is completed.

Design process from inception to completion is as shown below:

- i. Introduction
- ii. Case study
- iii. Socio cultural factor
- iv. Bioclimatic Data
- v. Location Map
- vi. Space Analysis
- vii. Site Analysis
- viii. Design Approach \ Concept
- ix. Plans. Sections, Elevations and Details
- x. Working Drawings and Schedule
- xi. Modelling

In manual drafting, architecture students travel from place to place in search of relevant data. The risks and time involved notwithstanding. In some instance students are not allowed access to most of the information for which efforts have been made. The problem has been alleviated through the application of ICT and with computers editing any aspect of the process would not affect the entire sections of the work already accomplished.

Architecture is a discipline that embraces several other perspectives as the course contents are taken from several subject areas. It is confluence of arts and science (Abdulkarim, 2005). The information required as design inputs does not reside in a particular subject and ICT provides means of navigating and disseminating the information.

Acquisition and dissemination of knowledge is becoming more flexible thereby redirecting human patterns of work,

collection of data, processing and analysing the data. This also affects the mode of presenting the information so derived. The use of computers for the training of architecture students must go beyond the context of mere ability to operate any of the application software but as integral part of programme where architecture students would be trained to explore the latest technology in search of relevant data about a particular design problem.

### USE OF COMPUTER AS ALTERNATIVE TO DRAWING BOARD DRAFTING

The idea is to explore the present technological revolution in its totality for architectural design. Digital Studio allows students to use any of the CAD packages together with digital media for retrieving relevant information needed as inputs for architectural design. The present drawing board drafting is time consuming and slow to meet the pace of the contemporary technological revolution.

Computers as alternative to drawing board for the training of architecture students will provide greater academic opportunities. It exposes students to acquire skills in other software relevant to architecture. CAD software such as AutoCAD, ArchiCAD, Architectural Desktop, Revit Series, power point and many others are employed in the production of presentation drawing, working drawing, animation drawing, modelling and analysis drawings. The graphical resolution and scientific precision outputs from design packages are unique and distinct from manual drafting.

Without doubt the role of the architect has been changing over the years (Olotuah, 2006). Technological changes especially in ICT, the increasing complexity in building design and the teeming population of architecture students have necessitated the use of computers for architectural design.

Therefore ICT is efficient for management and coordination of volumes of information involved in a design project and architects must avail themselves this virile tool of development in order to continue to be

relevant in this technological revolution.

### CHALLENGES OF INFORMATION AND COMPUTER TECHNOLOGY

The advantages of ICT cannot be underscored. The challenges posed to training architecture students in a developing country like Nigeria is by no means a small task. Information and computer technology is a capital-intensive venture. The installation and upgrading of existing facilities as new ones are developed call for effective financial commitment.

Operation of these developmental tools requires constant supply of power supply. Epileptic supply would not guarantee the desired results in the training of architecture students. The need to develop design software with local inputs for adaptation to the local environment is imperative for effective reliability and sustainability.

Efforts by schools of architecture in the use of computers for architectural design should be encouraged through the introduction of more computer applications to architecture courses in the curriculum. The digital revolution is a continuous process. The rate at which both new hard and software are developed require aggressive approach to the rudiment of using computers for architectural design. The need to domesticate adopted technology of software and hardware could not be underscored for self-reliance and maintenance sustainability.

### CONCLUSION

In view of the multifarious nature of training architecture students in a dynamic digital environment the use of computers as technological development tool is inevitable. There are many CAD software in circulation and more are still expected. The latest version is brought about as a result of improvement on the existing versions. While Use of CAD for training architecture students is yet to be fully realised in schools of architecture in Nigeria the global trend is now toward the use of Building Information Modelling, BIM, a new concept in CAD software.

The use of computer to train

architecture students therefore calls for continuing education for both the educators and students in a conducive environment devoid of physical and psychological stress and fatigue. The rate at which new software is being developed and existing hardware being upgraded are clear signal toward continuing education.

The most obvious factor that has been sustaining relevance of architecture is its ability to conform to global challenges. Architectural education curriculum should therefore reflect the use of computers as alternative to drawing board for architectural design. Teaching and learning would be easier if computer replaces the drawing board drafting in schools of architecture.

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