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DRAWING STUDIO DESIGN AND ADAPTATION IN THE POST-COVID 19 ERA:THE CASE FOR THE DEPARTMENT OF ARCHITECTURAL TECHNOLOGY AKANU-IBIAM FEDERAL POLYTECHNIC UNWANA. AFIKPO EBONYI STATE

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ABSTRACT

Diseases and their control has continued to engage the attention of many nations of the world, researchers, scientists, health practioners, manufactures of health products, world bodies like the world health organization (WHO). Covid-19 is a pandemic outbreak of a disease caused by a novel coronavirus now called severe acute respiratory syndrome coronavirus 2 (SARS-COV-2; formerly called 2019-ncoc), which was first identified amid an outbreak of respiratory illness cases in Wuhan city, Hubel province, China. The pandemic came with its devastating impacts on population of nations, health, economy, education, transportation, tourism, manufacturing concerns, commerce etc. This paper is an attempt to explore ways of disease control and prevention through Covid-19 compliant drawing studies by proposing a design model for such studies in the department of Architecture Akanu-Ibiam Federal Polytechnic Unwana. A descriptive study design was used in this study, the departmental design studio was used as the case study material, there were informal discussions from the academic staff and students of the department, review of related literature. Data collected were used to propose a design model for drawing studios in the school, it is also hoped that the model can be adapted for re-modelling existing drawing studios in other schools of Architecture in the country and for future design proposals.

Keywords: *Covid-19, Architecture, Drawing-studio, Architecture Design.*

INTRODUCTION

The Covid-19 Pandemic appeared first in Wuhan city, Hubel province, China on December 8, 2019; it is otherwise called coronavirus disease 2019 (Covid 19). It is defined as an illness caused by a novel

coronavirus now called severe acute respiratory syndrome coronavirus 2 (SARS-COV-2; formerly called 2019-nCoV). David, J.C. 2023.

It changed the narratives in many established norms, policies, and practices in different cultures and Nations of the world; it is a major "disease landslide" that is changing the demographic, socio-economic and health configurations of the entire global landscape. It gave rise to new discourses in the design of residential homes, educational institutions, health institutions and such other public spaces. From the perspective of learning and teaching, Covid 19 and its attendant lock downs have challenged our trust in institutions and in each other, caused distortions at the level of lecturer-student interaction and changes in patterns/models of imparting knowledge.

In the face of the severity of the Pandemic and its transmission mode, citizens were encouraged to wear face coverings in public settings were social distancing measures were difficult to maintain to abate the spread of the Pandemic, to observe isolation if one feels sick or experience the symptoms, school and businesses were closed and to avoid non-essential in door spaces. Others include postponing travel until one is fully vaccinated, enhanced ventilation, hand-washing and sanitization, avoiding sick people and staying six feet (6ft) apart. Over the past 2 years nations have made many changes to how their nationals live, work, play, worship and manage their health. (Cleveland Clinic 2023).

Architecture

The shorter Oxford English Dictionary, fifth edition (2002), defined Architecture as: "The art or science of building; especially the art or practice of designing and building edifices for human use, taking both aesthetic and practical factors into account". (www.oreilly.com>library>view>beautiful- Architecture). On the context of Architectural Practice with Nigeria; the Architects Registration Council of Nigeria (ARCON) which is a body corporate established by the architects (Registration, Etc) Act, Chapter 19, laws of the federation of Nigeria 2004,defines Architecture as "The art and science in theory and practice of design, erection, commissioning, maintenance and management and coordination of all allied professional imputs thereto buildings or part thereof and the layout and master plan of such building or groups of buildings forming a comprehensive institution, establishment or neighbourhood as well as any organized space,

enclosed or opened, required for human and other activities." (NIA, 2009). Architecture is both the process and the product of planning, designing and constructing buildings or other structures.

The design art is hinged on some basic elements namely: point, line, plane, volume. A design is nothing but the creation of a form and a pictoral form begins with the "point" that sets itself in motion. The point moves and the line, which is one-dimensional comes into being; if the line shifts to form a „plane", we obtain a two-dimensional element. In the movement form planesto spaces, the clash of planes gives rise to a volume (three-dimensional element). G.Muthu S.M. (2010).

Drawing Studio

As the art or practice of design and building edifices for human use; the architectural profession relys so much on the environment within which this is done. The environment is the drawing studio which in essence must be accommodating and condusive for any stated goals to be achieved. The drawing studio must not be a space that encourages easy infection and transmission of the covid-19 disease. It must be designed in such a way as to reduce to the barest minimum the incidences of infection and transmission of the Pandemic. Efforts must be made to guaranty the integrity of the health of the staff and students who make use of the space for design assignments, works and lecture from time to time as the case may be. Architectural design takes place in a drawing studio (such as obtains in an educational institution); it can also happen in someone's private residence where a drawing studio is included in the design, or in a private Architectural office.

Architectural Design

Architectural design means the design of any space such as a kitchen, a hospital, a workshop etc. It is the process by which an object which is to be physically constructed latter is first visualized as an idea. This idea is also known as a concept which can exist as mental idea or concept and representational idea. G. Muthu S.M. (2010). The BBC English Dictionary defines Design as the process of planning the form of a new object, a drawing of the proposed form of a new object like someone submitting a design for a new building; it also means a decorative pattern of lines, flowers, or shapes. The basic principles of architectural design of a building which are based on the function/specific purpose

and varied needs of the building are axis, symmetry, hierarchy, rhythm, repetition, datum, transformation; they are the "ordering principles" for visual methods that allow the form and space of a building to co-exist in order to make a design complete.

IMPACTS OF COVID 19 ON EDUCATION

Covid 19 Pandemic appeared on the world stage with a ferocious devastating effect. Its impacts were felt in the education sector, health, Agriculture, transportation, tourism, commerce, production and distribution of good and services; the impacts were also felt in the religious life of the people. The impacts of Covid 19 Pandemic on education can not be over-emphasized; hence urgent actions are required to curb learning disruptions.

According to Untied Nations Educational and Cultural Organization (UNESCO) over 800 million learners from around the world have been affected; 1 in 5 learners cannot attend school,1 in 4 cannot attend higher education classes, over 102 countries have ordered nationwide school closures while others have implemented localized school closures. Speaking generally, the Covid 19 pandemic adversely impacted the efforts of some governments aimed at increasing the education budget. Students, schools, colleges and universities have been affected deeply. Academic calendar which were hitherto planned were distorted, normal modes of imparting knowledge experienced some changes and there were heavy consciousness on disease transmission and prevention.

In their research work, UN Eze et al (2021) reported some of the impacts of the covid-19 pandemic to include the following:-

- School closure to stem the tide of the Pandemic.
- Poor learning attitude arising from fear of the pandemic unequal access to education opportunities and poor skills.

- Disruption of face-to-face approach to teaching and learning. Students could not come to lectures because of fear of spread of Covid-19.
- Poor school enrollment; long school closure and fear of spread of the virus impacted negatively on school enrollment.
- Inequality in Education: There was unequal access to opportunities in education. Some students do not have access to digital gadgets like phones and computers to help them in virtual learning. This brought about poor skills among some students.
- Poor achievement in educational performance arising from lock downs, closures and decreased commitment on the part of both lecturers and students https://digitalcommons.unl.edu.

The Covid-19 pandemic impacted education variously and some researchers report their findings according to their targeted area of research. Julius F.F. et al (2022) reported that the most social challenge of the global response to Covid-19 was the closure of schools to stem the spread of the Pandemic. This they say deprived millions of education personnel their means of income and hence reduced their overall well-being. The pandemic brought about so many deaths ravaging all age groups with over sever million cases globally as of June 7, 2020. Covid-19 pandemic caused huge trade disruptions both locally and on the international scene, there were drops in oil prices occasioned by lockdowns, drop in demand. This led to cut in production in some manufacturing concerns and therefore retrenchments which led to a humongous increase in the number of the unemployed roaming the streets. This led to an increase in discontentment, banditry and other social vices. The Covid-19 outbreak has disrupted education and raised global health concerns, no country or race is immune to the virus, and the entire world appears to be swamped by the pandemic‟s rapid expansion and catastrophic impacts. The pandemic knows no bounds and its impacts are widespread and swift with restriction on people's ability to migrate, trade, and interact. It also threw the entire world into a state of emergency, the reality of the situation was difficult to face, and Nigeria's school system remains one of the worst-affected by the Pandemic

(Akuh, 2020).

STATEMENT OF THE PROBLEM

The Covid-19 Pandemic was devastating in many nations of the world many of which recorded millions of deaths among their population. Among the many aspects of human life affected was education having brought about distortions at the level of lecturer-students interaction and in the patterns/models of imparting knowledge.

This scenario has created a huge problem which must be tackled through design and other measures so that lecturers and students in the department and by implication in other schools can freely engage themselves without fear of being infected with the virus.

RESEARCH OBJECTIVES

The need for the provision of a disease free drawing studio cannot be over –emphasized especially going by the effects of the Pandemic. Therefore, the objectives of this study include:

- To use the perception of both lecturers and students on what factors to be considered in the design of Covid-19 compliant drawing studios.
- To use such factors in proposing a drawing studio model which will help in reduction, prevention and control of the incidences of transmission of the virus.
- To suggest further measures to reduce/arrest the incidence of the Covid-19 Pandemic on both lecturers and students.

RESEARCH METHODOLOGY

The research method utilized in this study is the descriptive survey; data were collected from both primary and secondary sources. The primary sources were through informed discussions among academic staff and students in department. The secondary data involved a case study of the drawing studios in the department; there was a review of related literature on Covid-19, architecture, architectural design and drawing studio.

THE DRAWING STUDIO AS A STUDY SPACE IN THE DEPARTMENTARCHITECTURE

The Covid-19 pandemic and its effects on education raised pertinent questions on the adequacy and safety of the drawing studios. Before the Pandemic, the design of drawing studios relied on the already known

design considerations such as good circulation, proper anthropometrics, adequate and proper ventilation, good lighting, good form etc. However Covid-19 and its effects began to interrogate the adequacy or otherwise of a space to be occupied by a student in a drawing studio, the circulation space available per student and the nature of materials used as finishes in the space. It because extremely necessary then to reduce or stop the spread of the virus by asking questions on what measures to be taken in order to ensure the safety of the health of both lecturers and students as well as those of the non-academic staff in the department. Through discussions among members of the academic staff and students of the department, the following information/data were gathered concerning the design of a drawing studio that meets at least the basic requirements of a studio to be in tune with the realities of the Covid-19 Pandemic.

- Comfortable office spaces
- General toilets for students
- General toilets for non-academic staff.
- Drawing studios for ND I, ND II, HND I, HND II.
- Computer aided design (CAD) room
- Departmental library
- Modeling and photography room
- Resources Room
- Departmental meeting hall
- Jury Halls
- Out- door study space
- Shelves for students‟ design projects.
- Disinfection room at the entrance of the building or the drawing spaces if need be.
- A court yard to aid in ventilation.

The above will form the briefs which will be used to propose a design model for the department of Architecture in Akanu-Ibiam Federal Polytechnic Unwana; and can also be adapted in other departments of architecture elsewhere.

CASE STUDY

This building which presently houses the drawing studios is popularly known as “Academic Complex”, it is one of several buildings in the school designed by Messers Nwankwo Scoth

Associates-an architectural firm based in Enugu State Nigeria. It is a

one-storey block of 10 lecture halls each measuring 12000mm x 10,000mm. Though the studio space has two entrance/exit doors, there is no design features to accommodate procedures that will help checkmate further spread of the Covid-19 virus or detect those susceptible to it through temperature check or other tests. Any student infected with the virus can easily enter the studio through any of the doors, cough, sneeze, have a handshake with fellow students who might get infested unknowingly and the lecturer in the studio is not exempted from being infected too. Looking at the scenario from another perspective, the main entrance to the building which is the place where these measures can comfortably be situated is lacking in them primarily because it was not designed to function as such. Aside the dimensions of the individual halls nothing qualified them as an acceptable ideal drawing studio; for want of space for the department, the halls are being used as drawing studios which however lack the basic requirements of an architectural drawing studio. The Computer-Aided Design (CAD) room, modeling/photography room, lecturers‟ offices, office of the head of department, restrooms are all located in another building altogether. Quite ugly, there is no provision for students‟ restrooms in the building under investigation or in the other building where lecturers have theirs. Hence it is difficult to contemplate the realities of the Covid-19 Pandemic in terms of its prevention, control and eradication more so as its variants keep evolving from time to time.

Plate I: Photo shot of the building (known as Academic Complex) housing the drawing studios and the architectural library, all located at the first floor. The ground floor is for the use of other departments.

Plate 1a: Exterior perspective of existing building

Plate 1b: front elevation of existing building

Plate 1c: Perspective of Verandah existing building" existing studio

Plate 1d: Interior perspective of existing building

Plate 2: Dimensions of an existing drawing studio space, 12000mm X 10,000mm. This can however be remodeled to accommodate the realities of the Covid-19 Pandemic in terms of disease prevention, control and eradication.

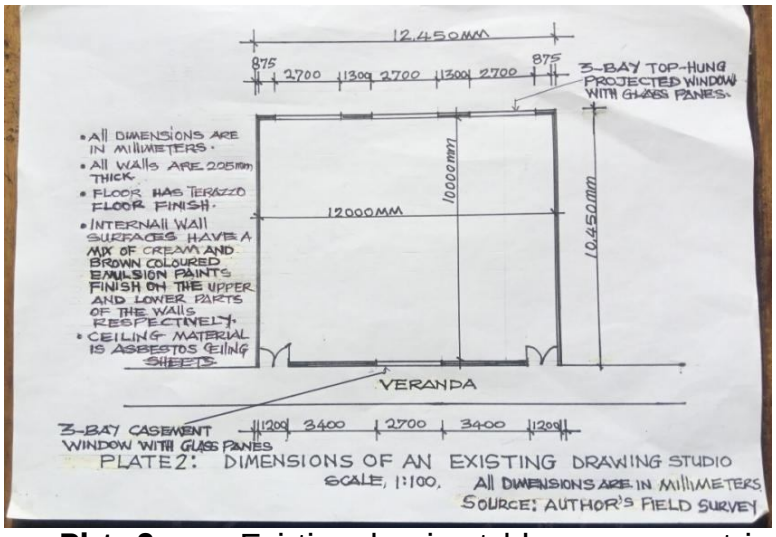
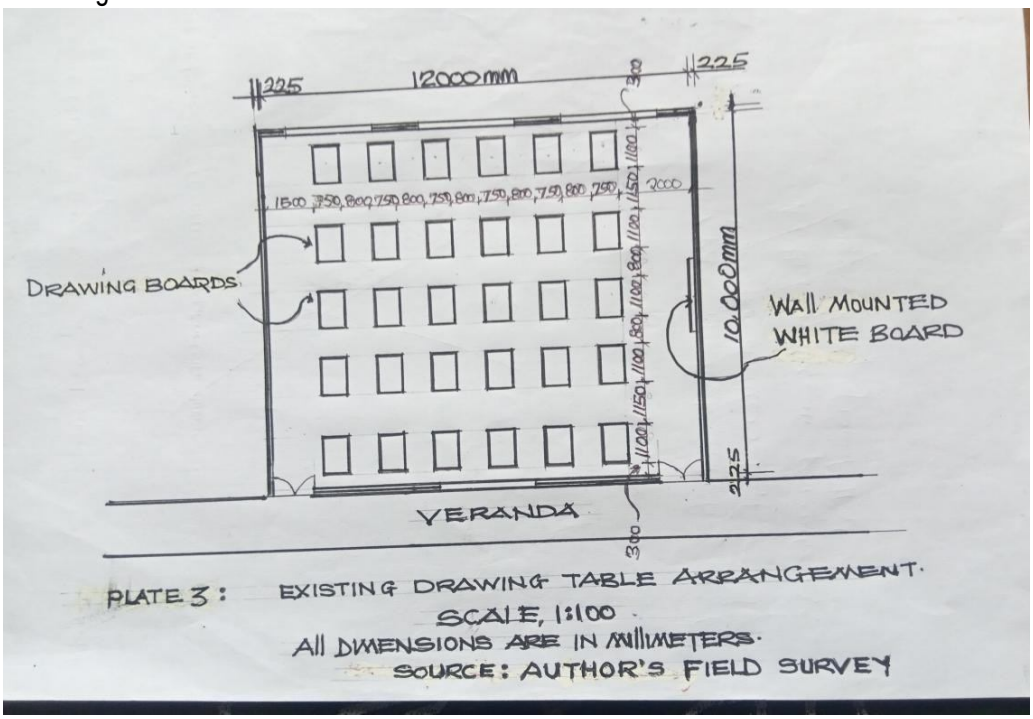


Plate 3: Existing drawing table arrangement in a drawing studio in the department. Notice the varied space in between drawing tables, 800mm-1150mm sideways, and 800mm in the front and back of tables. Size of drawing boards is 1100mm X 750mm.



THE PROPOSAL

In putting down this proposal, the paper relied on the data got through discussions and informed interviews from among members of the academic staff and students in the department; it also did consider other measures for a Covid-19 compliant building and drawing studios. These other measures include:

- Use of Anti-microbial surfaces in the studios
- Designing for cleanliness (use of Aseptic materials).
- Use of Air-modifiers at the main entrance of the building and in the studios.

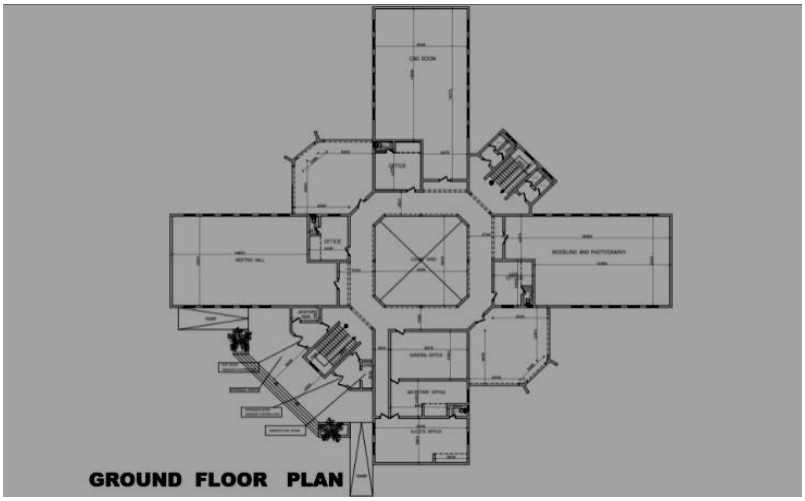


Plate 4: Ground floor ofproposed Building

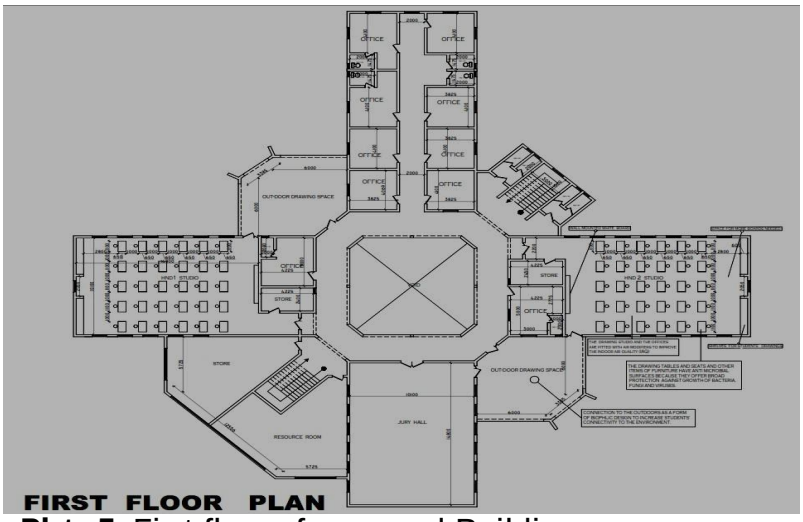


Plate 5: First floor of proposed Building

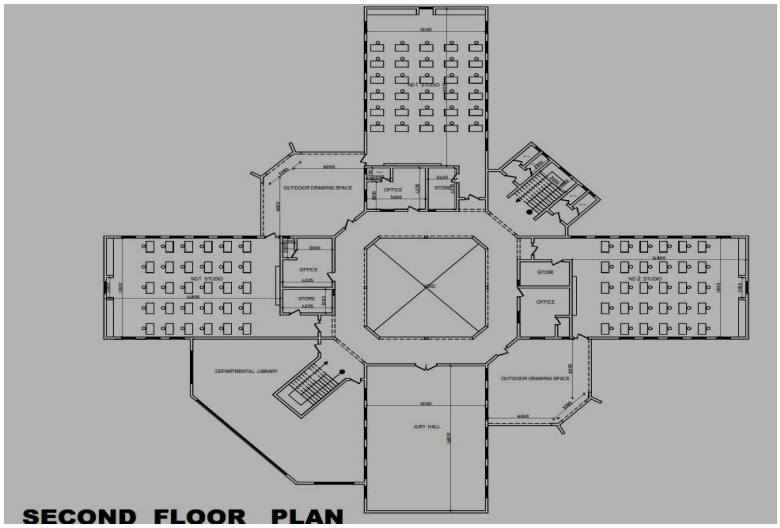
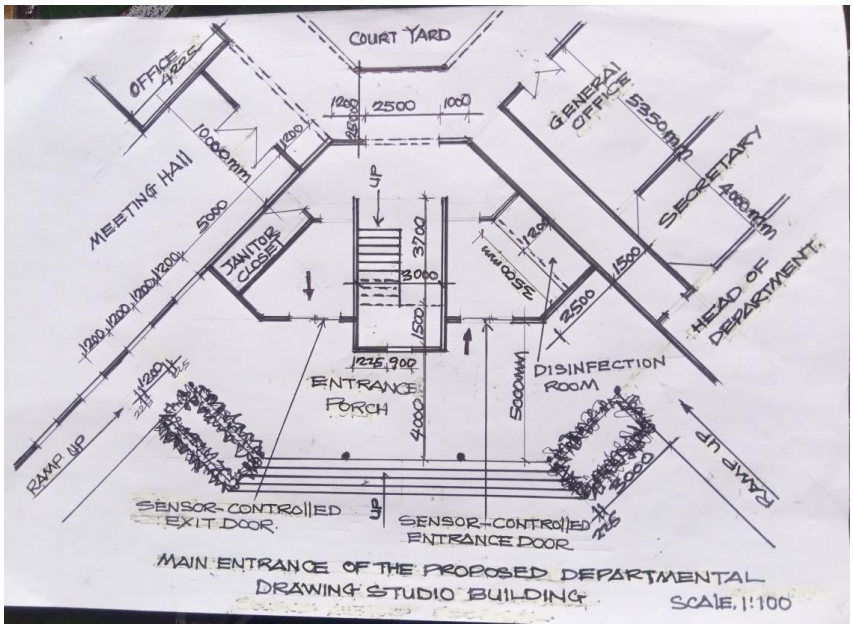
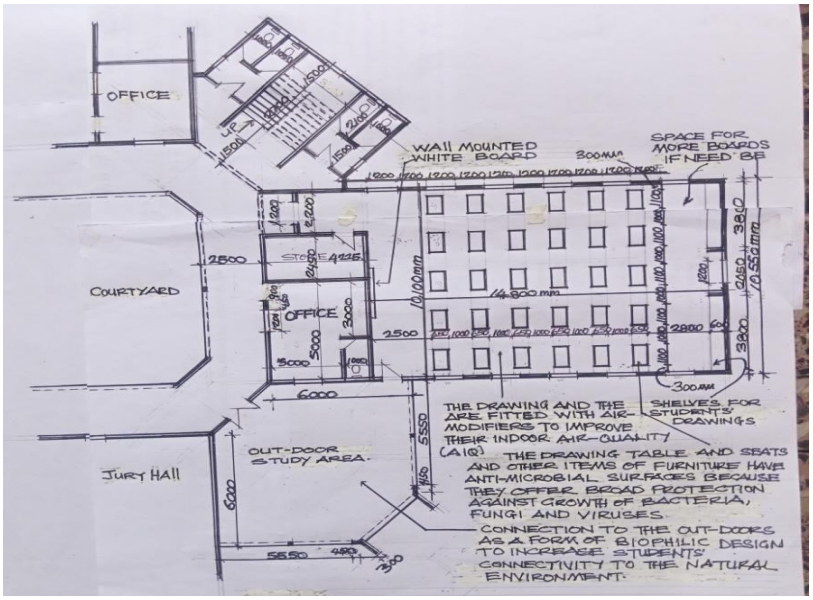
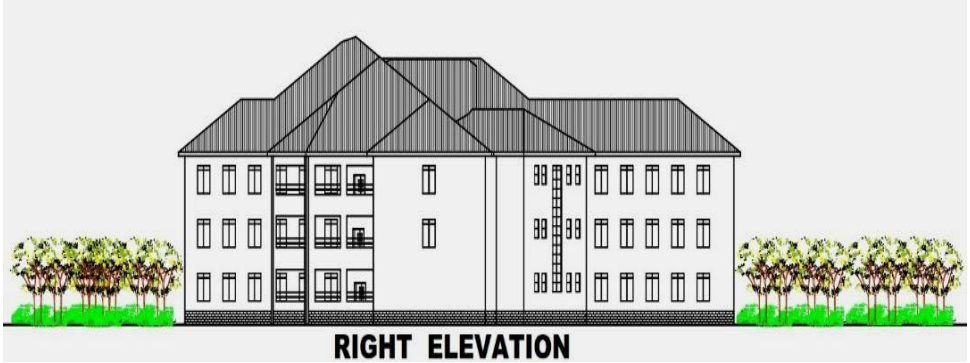


Plate 6: Second floor of proposed building





PROPOSED DRAWING TABLE AND STUDIO ARRANGEMENT



3- **Dimensional Views of Proposed Building**

Main Entrance to the Building

This is where the process of measures to reduce transmission, infection, contamination starts. It has a sensor-controlled entrance and exit doors separated from each other. Every member of staff and all students going into the departmental building must enter through the sensor-controlled entrance door, into a space where regular washing of hands and sanitization take place. There is ease in entering because members of staff and students do not have to struggle with door handles as these can be veritable points through which diseases spread. (see plate 7: Main entrance) those exiting the building go through the sensor-controlled exit door to avoid contact with those entering through the disinfection room, since they do not need to disinfect again. The paper proposes the use of Air modifiers at the entrance also (precisely the disinfection room) to improve the indoor Air quality (IAQ) which refers to the quality of air with and around building occupants. United States Environmental Protection Agency (EPA, 2022). Air Modifiers generate oxidizing molecules from ambient air which work to eradicate pathogens at a cellular level such as: coronavirus (-299E), norovirus, Staph, influenza, mould, rhinovirus, and odors they cause. An example of an air modifier is the Airphx technology which eliminates odors, bacteria, viruses and other harmful organisms and is trusted in schools for complete in door disinfection. (https://airphx.com).

The Drawing Studio and other spaces in the proposed building

The drawing studio and other spaces in the building are also proposed

to be fitted with air modifiers; all items of furniture to have anti-microbial surfaces. They are very much needed in the design of drawing studios in the post-Covid-19 era because they offer broard protection: theyprevent growth of bacteria, fungi and viruses on drawing table surfaces and those of seats, they can help stop the growth and spread of microbes that could harm both the lecturers and students alike. Drawing studios and other spaces in the building can be seen as anti-odor, anti-spoil or anti-spread hence anti-microbials can help in countless ways in those spaces. (American Chemistry council, 2023). Designing to promote cleanliness is an important consideration for the design of drawing studios and such other spaces; this can be encouraged through spatial organization like arranging the drawing tables in such a manner as to maintain the minimum 1000mm (1m) distance apart. It can also be encouraged through material choices such as the use of non-porous, smooth materials which are much easier to clean and disinfect, hence the proposal for wood materials for drawing table tops, concrete floors with antimicrobials for drawing studio floors and such other surfaces.

CONCLUSION

The Covid-19 Pandemic affected education, health, agriculture, commerce and industry, socio-economic development, tourism, oil and gas industry etc. In the education sector, it caused disruptions in learning, many could not attend school because of nation-wide closures, academic calendar which were hitherto planned were distorted, normal modes of imparting knowledge experienced serious challenges. Measures such as social distancing, wearing of facemasks, regular washing of hands, hand sanitizing and avoiding crowded places were put in place to checkmate the scourges. The paper tried to present a solution towards ameliorating the incidences of transmission, spread, infections of the virus through proposing a design model for aCovid-19 compliant building and drawing studio for the department. In doing that it took considerations for responses from both academic staff and students in the department to build up a brief for the proposal. Factors considered included separate doors for entrances and exit, incorporation of a disinfection room at the entrance, use of sensor-controlled doors to avoid touching door handles, use of air-modifiers, antimicrobial surfaces and aseptic materials in the studios and such other places. Also incorporated is an out-door learning environment for the studio halls to connect to the external environment. The proposed

model, it is hoped will help serve the Covid-19 compliant needs in the department and as well serve as a references point in the design of such structures elsewhere or in the future.

RECOMMENDATIONS

The Covid-19 Pandemic brought about new narratives in educational system and in the way and manner knowledge is imparted, it challenged the adequacy and relevance of existing considerations for the design of structures harbouring design studios. Based on the findings of this paper, the following recommendations are proposed.

- The drawing studio should be re-assessed in terms of its size to accommodate the distance between individuals (students) which was recommended by the Nigeria centre for disease control (NCDC), at least I meter.
- Drawing board sizes (A1 size) measuring 920mm x 650mm should be well arranged in the studio so as to maintain the 1 meter physical distance requirement to minimize the likelihood of transmission through physical and other practical means.
- The main entrance to the departmental building should have a protected zone (disinfection room) for regular washing of hands, hand sanitization, temperature checks etc. anybody going to the department must pass through this zone.
- Drawing studios should have some form of connection to the out doors as a form of Biophilic design to increase students connectivity to the natural environment through the use of direct nature, indirect nature, and space and place conditions.
- The entire drawing studio space should be a protected zone and this can be achieved by the introduction of anti-microbial surfaces in the design as they offer broad protection against growth of bacteria, fungi and viruses on drawing table surfaces and those of seats.
- Every drawing studio should have a means of controlling the indoor air quality and this can be achieved through technology such as the AIRPHX technology which generates oxidizing molecules from ambient air, the molecules eradicate pathogens at a cellular level such as coronavirus, norovirus etc.

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