CHALLENGES OF OPTIMAL VIRTUAL ARCHITECTURAL EDUCATION INFRASTRUCTURE IN POST COVID-19 NIGERIA

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Abstract

The covid-19 pandemic exposed the weaknesses of the various institutions at global, national and institutional levels. There is therefore the need to look at the challenges affecting the spheres of the architecture education at both formal and informal levels. The paper x-rays the challenges of virtual architectural education training so as to prepare stakeholders for post Covid-19 architectural education programme. It prepares the mindset of stakeholders for lifelong intra and post covid-19 architectural education pedagogy in the Departments/Faculties of architecture and practice as this would ultimately determine the quality of the architect, the architecture process, and the product to determine the quality and process of the post COVID-19 architectural education. It looks at relevant literature and practical experience on the architecture profession, practice, research and education. It discovered that although there has been serious attempt at e-learning in the past with a weak virtual infrastructure dual mode of educational delivery will be most appropriate. Dale's cone of learning can be adopted to strengthen the e-learning experience in architecture,(Lubol.2017). It agrees that the future of the profession must stand on an optimal if not a strong virtual architectural infrastructure to compete with emerging global competition. It therefore suggests a hybrid approach, and the need to update and strengthen existing virtual infrastructure at individual, institutional, corporate, and national levels through Information and Communication Technology, ICT, networking and collaborations. It concludes that the post COVID-19 era though challenging offers a great potential for the profession through e-learning architectural education based on emancipatory critical pedagogy of Paulo Friere (Nafukho,2020; Dale's Cone of Learning,Lubol,2017) . This must be explored fully for the benefit of the country.

Keywords: Architecture,COVID-19,education,e-learning,profession

. Introduction

Education is a process not an end that involves the acquisition of positive knowledge, skills, values, beliefs and habits for ones benefit and that of society, Fafunwa,(1994) in (Abubakar,2013).For Dewey,(1978),it is growing venture, with no end beyond itself and has no final destination. Education as a process equips the one with cognitive, affective and locomotor skills and knowledge to be useful to self and society. Students in the university are regarded as adults and therefore the pedagogical method of teaching must incorporate adult learning principles. Change teacher centricity ad learner passivity to dialogue involving both teacher and learner. Since the university involves adults, Vella,(2002) dialogue education theory in adult learning is therefore very relevant. The theory developed around adult learning factors of respect, immediacy, safety, engagement, relevance, and evaluation should be incorporated into the curriculum and method of delivery for effective post covid-19 e-learning. Another important principle in adult e-learning is the Edgar Dale's Cone of Learning which shows how much one remembers from different ways of learning. Dale's Cone of Learning makes it clear that students remember 10% of what is read in the texts, 20% of what is heard by listening to a lecture, 30% of what is seen by looking at pictures, 50% of what is hear and seen by watching demonstrations, 70% of what is said by participating in discussions or giving a talk, 90% of what is said and done by doing a dramatic presentation such as a role play while teaching others gives 90-95%,Figure1a.
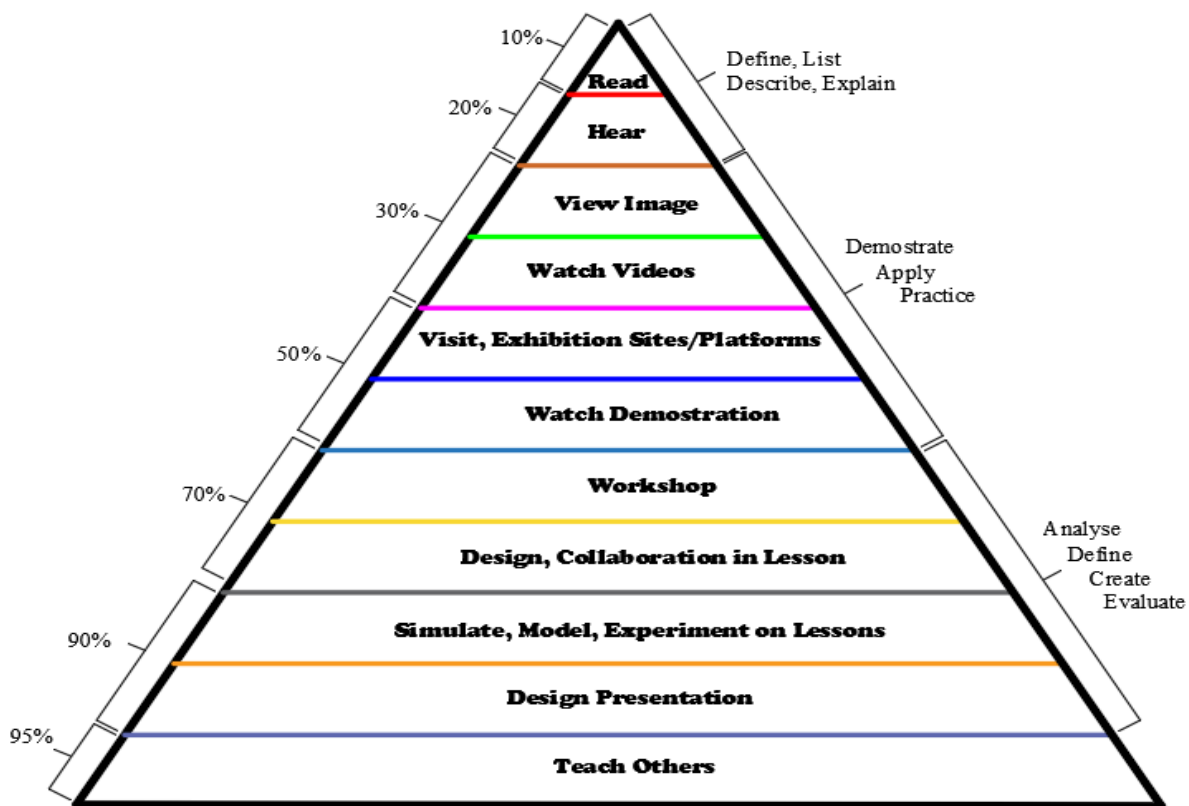

Fig 1a: Adopted Dale Cone of Learning

Since university education does not only have a liberating task on individuals but also the society, it is a form of empowerment that equips the students to be self-reliant conscious human beings

that learn through formal, informal and non-formal settings in order to develop fully and become productive members of the society. With the transformations, it can authoritatively be stated that universities are relevant to society where education involves the transmission of knowledge, skills, abilities and attitudes that are relevant to the learner and the society. A hybrid education system must therefore have a strong dialogue approach to make the necessary impact in the society.

Education as a complex and multidimensional concept is an inter-subjective process of learning that to makes learners not only self-reliant but advances the society. The Covid-19 experience has re-emphasised the virtual, digital e-learning infrastructure and management systems as vital component of the society that must be developed. It brought to the fore the need to intensify and upgrade all the infrastructure already in existence. These are the digital media platforms,(Fig.1b) the internet, the google classroom, the zoom, telegram, instagram, youtube, luminate for schools to invigorate virtual studio apps with a view to developing and introducing new ones.
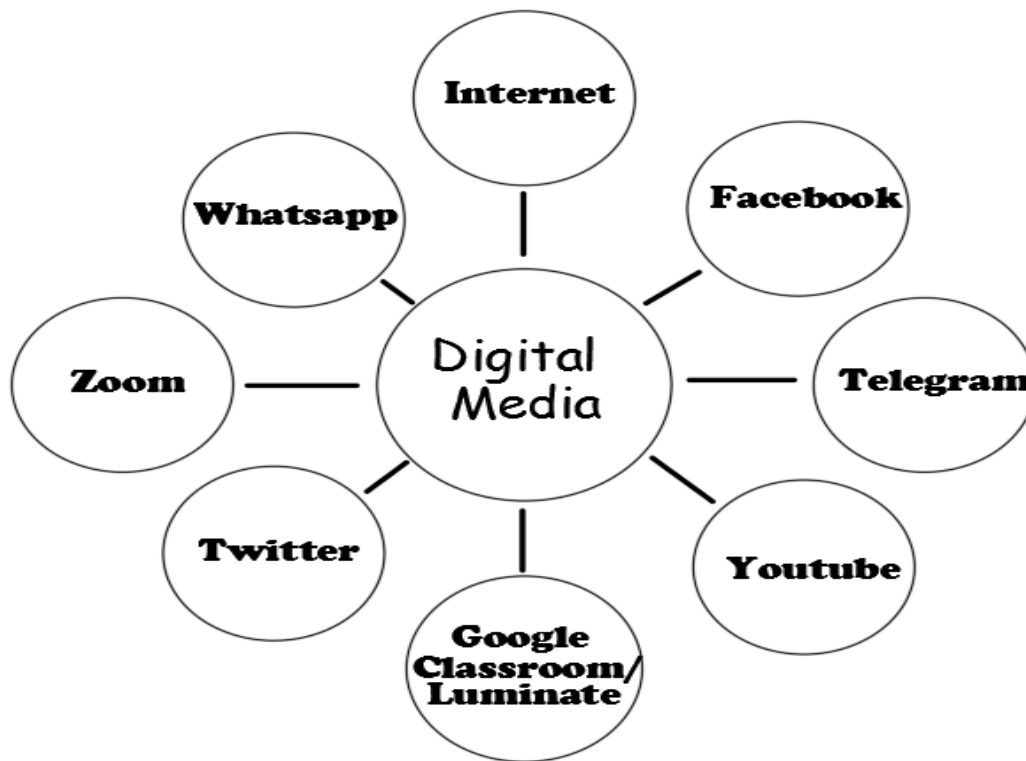
Fig 1b: Digital Media

A fact that must be embraced is that digital education which has suffered delays in the past has come to stay and therefore no going back to the old system but instead a hybrid system should be developed. The hybrid system effectively combines face-to-face with e-learning to accommodate

practical courses such as freehand sketch, graphics and lettering, field work and case studies. In line with this all learning platforms such as facebook, google, BIM are to retool actively for this digital revolution of integrating real time platforms. More researches in line with this reality to fast track the change are therefore needed.

Problem Statement

Although the Departments of architecture in Nigeria have touted virtual components in architectural education especially during accreditation exercises, the covid-19 experience has exposed the weakness and lack of depth of virtual infrastructure in Nigerian universities in general and the Departments of architecture in particular. The questions of virtual studio, handling of field trips and teaching methods for graphics and lettering, freehand sketches and other practically oriented courses have remained unresolved. There is therefore the need for infrastructure audit and upgrade to be able to improve on and tackle these and other problems. This situation has made it imperative for synergy with the private sector to realise the establishment of a robust virtual infrastructure system as a solid foundation of intra and post covid-19 architectural education in Nigerian universities. This would also affect the issue of curriculum development, instructional materials and equipments needed at individual and corporate levels to accomplish the specific teaching objectives.

Conceptual Framework

Resilience is the ability of a system to bounce back after depression or shock by creating a new dynamic equilibrium for survival. Covid-19 brought great shock to the global educational system of which survival response is on virtual system of e-learning. Thus a new system of educational resilience is gradually evolving into perfection. Sustainability of an enduring educational system with hybrid face-to-face and e-learning infrastructure being developed at every level as means of life-long learning experience referred to as metacognition. Resilient metacogintion,(Fig.2) Nafukho,(2020), as concept, is lifelong learning that involves the process of learning continuously throughout life not necessarily dependent on curriculum reforms. As part of cognitive psychology,

Resilient Metacognition : Life Long Learning

Creative mental adaptation activities	Thinking	Memory Development	Language Communication	Perception Development

Leads

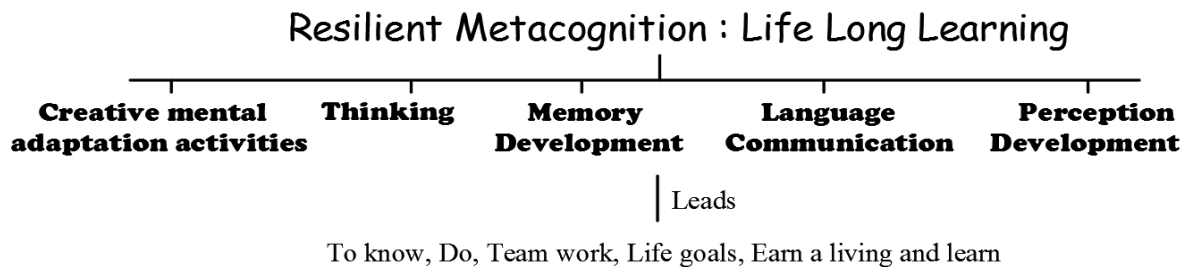To know, Do, Team work, Life goals, Earn a living and learn

Fig 2 : Metacognition

Mangal,(2009), agrees that it concerns thinking, memory development, language communication, development of perception, imagery and creative mental adaptation activities. This agrees with Kolb,(2009),life cycle learning which identifies experiential learning as encompassing; concrete

experience, that leads to reflective observation, abstract conceptualization, experimentation and then the cycle continues. It prepares learners not only to acquire the necessary knowledge, skills and attitudes, but curious holistic lifetime learners for life and work. It comprises ; learning to know, do, team work, meet life goals, earn a living, and how to continue learning at all times which Nigerian universities need most. This ensures when confronted with unique and complex problems, one has the capability to learn, unlearn and re-learn how to address them. Universities need to promote lifelong learning that takes place in formal university settings, as well as informal and non-formal learning settings throughout life. This enriches personal lives, fosters economic growth, maintains social cohesion, and environmental sustainability.

Therefore a system of educational resilience system should provide opportunity for continuous learning and unlearning as a means for continuous development. The paper agrees with this new innovation and feels that a resilient educational infrastructure must be developed by the Nigerian educational system in line with the emerging global trend.

Methodology

The paper looked at various relevant literature from online and hard copy sources adapts adult learning theories using the Dale cone and Vella,(2002) learning dialogue which never envisaged the covid-19 or any other pandemic situation. With a qualitative analysis summaries were made and proposals done on these approaches to adult learning system. The paper then identified meta-cognition or lifelong learning concept as crucial in the attempt to introduce hybrid architectural education in Nigerian universities.

Literature Review

In as much as e-learning has great potential in the educational system of Nigeria, a lot of challenges need to be tackled for effective digital cum hybrid education,(Fig.3). These are;

i). **Digital upgrade**; Udegbunam,(2020), quotes the Minister of communications and digital economy, Mr. Isa Pantami, as initiating digital upgrade of public institutions by patronising the private company; Galaxy Backbone LTD,(Premium Times,September,3,2020. He revealed that all the virtual federal executive meetings were possible because of the upgrade of ICT infrastructure in the relevant federal public institutions. These were State House with 1500 Local Area Network, LAN, points, Federal Secretariat phase I, 2750 LAN points, Federal Secretariat phase II with office of Secretary to federal government, 1176 points, Mabushi housing the office of Minister of Works and Housing has 800. The facilities were originally deployed 8 to,12 years ago with validity period of five (5) years maximum which has since elapsed. He hinted however that an audit would be carried out to identify more of those that needed upgrade. This implies that all the public institutions in Nigeria need this audit for optimal and effective virtual and e-learning performance.

ii). **Capacity Building**: This requires collaboration and partnership with large and tested Information and Communication Technology, ICT, providers at the quantum and optical fiber levels. On quantum cutting-edge Information Technology, IT, computing, Cochrane, (2020) observed that it is developing across Africa, with South Africa considered the hub through an IBM centre in Johannesburg. This could enable academics throughout the continent to freely access IBM, quantum computer network, based in the United States.

Stellenbosch University in the Western Cape.

South Africa's University of KwaZulu-Natal, University of the Witwatersrand are using IBM. Google developed a 53-qubit device which it claimed took 200 seconds to sample one instance of quantum circuit a million times. The IT company claimed it would take a state-of-the-art digital supercomputer 10,000 years to achieve this feat.

The University of Waterloo Institute for Quantum Computing stresses the quantum computers' ability to express a signal (a qubit) of more than one value at the same time (the "superposition" ability) with that signal being manifested in another device independently, but in exactly the same way of the "entanglement" ability. This enables quantum computers to handle much more complex questions and problems than standard computers using binary codes.

The IBM Research Laboratory in Johannesburg offers African researchers the potential to harness such computing power as part of a 10-year investment programme through the South African government's Department of Trade and Industry. This portal to the IBM Quantum Experience, a cloud-based quantum computing platform accessible to other African universities that are part of the African Research Universities Alliance (ARUA), involves 16 of the continent's leading universities in Ethiopia, Ghana, Kenya, Nigeria, Rwanda, Senegal, Tanzania, Uganda and South Africa as hubs.

iii). **Pubic and institutional power supply system.** Public power that combines the renewable and none renewable forms must be explored without further delay. Such sources as solar, wind, hydropower green farm systems must be developed at institutional, corporate, and regional levels to arrest the epileptic and at times none existent power supplies for effective digital education.

iv).**Ethics;** Sachs,(2020),identified ethical issues for staff and students by services professionals, practitioners, and organizations as: laws of the land, spirituality and religion, culture, institution goals, mission and regulations, professional ethical and students union codes. Copyright issues on lecture materials are also important.

Kitchener,(1985), identified the following principles that can guide professionals when servicing students as; being respectful, making students see inherent benefits, facilitating learning, safe environment, high standard of professional behavior, and safety. v).**Cyber Risk Management;** Gregory,(2020) states that this involves protection from physical and psychological harm, compliance with the legal environments to reduce or avoid crime, terrorism, violent political protest, governmental interventions, genocide and other violence-related issues. It went on to identify some applicable risks as those concerning student organisations, speech and expression, emergency responses, international students, gender-related issues, institutional culture, codes of conduct, student health, public, fire and life safety, disability rights, records privacy, alcohol and drug issues. Other risks are; strategic risk based on the goals of the university, financial risk based on potential financial loss due to lawsuits, operational risk in form of institutional management for employees, student affairs services, volunteer groups, sports teams, classroom activities and research.

Others are; accounting and finance, health and safety, and medical services, compliance risk associated with standards related to health and safety, workplace safety. Reputational risk that results in the maintenance of positive image that enhances the image of the institution.

vi).**Legal issues.** These have impacts on student affairs and services such as cyber laws. These are based on;constitutional law ,statute law, common law for taxation and police affairs, religious law tort law, administrative law to regulate government agencies, criminal law, contract law, tax law, laws relating to health and safety law as recently argued on 5G system, labour law, immigration law, copyright law, patent and trademark law, anti-trust law, environmental law, disability law, accreditation and research laws .
vii).**Mental Health;** Sudden changes in activities normally lead to a lot of depression and stress. The Covid-19 experience no doubt has its on effect on the mental health of the people. It is therefore necessary that the post Covid-19 school era must have adequate arrangement for counseling and mental health of the university community on a lifelong basis.

Challenges of Hybrid Education

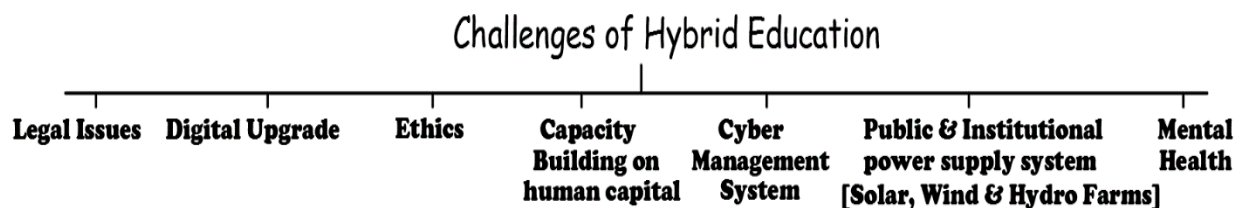| Legal Issues | Digital Upgrade | Ethics | Capacity Building on human capital | Cyber Management System | Public & Institutional power supply system [Solar, Wind & Hydro Farms] | Mental Health |

Fig 3 : Challenges of Hybrid Education

Lifelong learning equips the learner with the necessary foundation and motivation to continue learning throughout life from the cradle to the grave. It has multiple dimensions and contexts, encapsulated horizontally in the home, local community, economic environment and the mass

media and vertically between different levels of learning such as preschool, kindergarten, elementary, secondary, tertiary, workplace, and college levels. Universities are therefore endowed with the human, technological and financial resources necessary to promote and sustain lifelong learning as it is a multi-dimensional concept that can be used to organise all education and training throughout life to nurture individuals' and societies' core skills and competencies. It involves learning behaviours, gaining of knowledge, understanding of attitudes and values required for personal growth, spiritual, social and economic well-being, democratic citizenship, cultural identity and employability. Thus, the only way that universities can remain relevant in post covid-19 era is by offering a holistic education for life and work. It increases citizen participation and promotes socio-economic transition and democratization, driving political stability and social inclusion and promote democracy to reduce political instability.

It therefore has the transformative potential to promote, actively engage citizens capable of questioning decisions taken by their leaders thus solving problems at family, community, regional, national and international levels.

Recommendations

The e-learning programme to have short term, mid term and long term aspects. Use of whatsapp, text messages, internet, external radio and television programmes are short term while use of internet providers could be midterm, The long term should be development of university based electronic mass media network, broadband network and advanced softwares, Wide Area network. Others are;

1.**Audit** of physical and e-learning infrastructural facilities in each department or faculty of education in Nigerian universities.

2.**Upgrade** of the facilities in the departments of architecture for virtual library, Local Area Network LAN, Wide Area Network,WAN,broad band networks, improved fibre network. All these to be built into E-Learning Network Management System, (ELNMS) with its component E-Result Management System(ERMS).

3.Continuous robust professional and human capital development and training to include script lecture writing and e-learning software development

4.Curriculum Development; Convening of curriculum conference with a view to having a curriculum development for the curriculum review to incorporate virtual programmes

5. Modular approach to curriculum content;All courses should be in modules so as to have questions from each section depending on the number of units or contact hours

6.Dual or hybrid mode for courses that need field work or practical

7. Solar,wind and hydro farms; Construction of renewable solar, wind and hydro hybrid farms for the generation and use of energy from zonal green farms at zonal and regional levels in Nigeria. Ghana is already in this type of project under a Nigerian of UBI Energy Corporation(www.ubicorp.org).

Conclusion

Although covid-19 triggered off the issue of e-learning, it has come to stay as part of the development system of the century and the future. It has led to the deserved attention to digital

lifestyle evolving into a hybrid system not only for the educational development of the society but affecting all aspects of human existence in Nigeria and the global community. Architectural education being part of the system therefore has no option than to embrace it with a planned approach that involve short, medium and long term programme to reduce the inevitable change shock associated with any change and more so this digital revolution.

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